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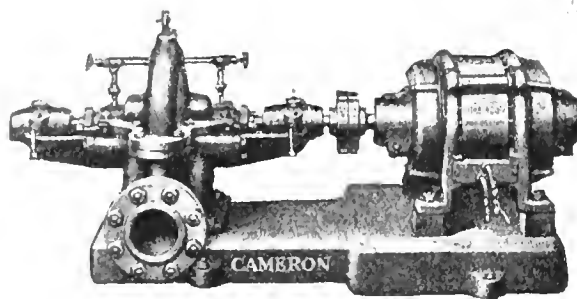
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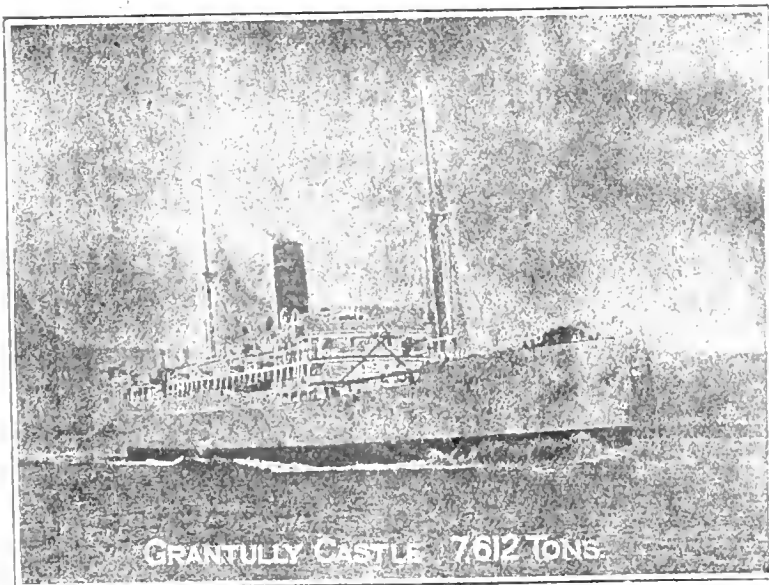
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The Consolidated Gold Fields of South Africa, Ltd.

REPORT OF THE DIRECTORS

Presented to the Shareholders at the Ordinary General Meeting, held at the Cannon Street Hotel, Cannon Street, London, E.C., on Tuesday, the 21st day of November, 1916, at noon.

ACCOUNTS.

The Directors of the Consolidated Gold Fields of South Africa, Limited, present to the Shareholders the following Report on the Company's affairs, with the Accounts for the year ending 30th June, 1916, and Balance Sheet at that date.

CAPITAL.

The Ordinary Share Capital of the Company remains at £2,000,000 and the Preference Share Capital at £2,500,000 in 1,250,000 Six per cent. First Cumulative Preference Shares, and 1,250,000 Six per cent. Second Cumulative Preference Shares.

DEBENTURES.

The Debenture Issue has been further reduced since 30th June by the drawing of £25,000, leaving the outstanding Debentures at present £100,000.

PROFITS.

The realised profit on the year's operations is mainly derived from dividends received on investments, and after deducting Debenture interest and all outgoings shows a balance to credit of £440,140 18s. 2d., from which the dividends on the First and Second Preference Shares, French and South African Government taxes have been provided, leaving £283,916 15s. 5d.

The depreciation, which is largely due to the fall in value of shares in mining companies whose length of life is now becoming a factor in the market price, amounts to £232,264 15s. 9d., which has been provided for by charging £100,000 against the Reserve and £132,264 15s. 9d. against the year's profits, after deducting which the sum of £151,651 19s. 8d. remains. Adding thereto the sum of £80,088 1s. 3d. brought forward from last year, there remains an available balance of £231,740 0s. 11d.

In addition to the foregoing realised profit the Company's share investments as per Schedule No. 1 (apart from any appreciation in value on properties and ventures, as per Schedule No. 3) show, on current market prices, and on an estimate of unquoted shares, a further large unrealised profit.

Investments stand in the books at average cost or under, and all shares are taken into account at prices at or below those current at the date when the accounts were made up.

SCHEDULES OF INVESTMENTS.

Schedules of the Company's principal investments and unfloated properties are appended to the Accounts.

RESERVE

The amount to credit of Reserve now stands at £700,000, of which part is invested as per Schedule No. 2, and the remainder in the general assets of the Company.

DIVIDEND.

The Directors recommend that a cash dividend of $7\frac{1}{2}$ per cent., free of Income Tax, be paid on the 2,000,000 Ordinary Shares, amounting to £150,000, leaving £81,740 0s. 11d. to be carried to the credit of the current year's Profit and Loss Account.

TRANSVAAL.

Full details concerning the mines controlled by the Company in the Transvaal are contained in the annual reports by the Manager of the Company in Johannesburg, and by the Superintending Engineer.

Notwithstanding the continuance of the war in Europe and in East Africa, and the consequent further serious depletion of the mine and office staffs, the mining operations on the Witwatersrand during the past year produced a record output showing profits somewhat exceeding those of the previous year. The profits earned by the mining companies, in which the Company is interested, have shown in the aggregate a corresponding improvement. This favourable result is mainly due to the praiseworthy work performed and the loyal spirit shown by the Managers and employees remaining on duty, and to the increase in the native labour supply, which has to a great extent balanced the effects on profits of the increased cost of stores and mining supplies.

FAR EASTERN RAND.

The past year has been characterised by the favourable

development disclosures on the Far Eastern Rand, in which district the Company, acting on the advice of its Engineers, has acquired share interests.

SUB-NIGEL, LIMITED.

The Company's considerable shareholding in the Sub-Nigel, Limited, as appreciated in value owing to recent development showing marked improvement in reef width, lateral strike and gold contents, and the potentialities of the Farm Grootfontein, adjoining the Sub-Nigel property (owned as to 86 per cent. by the Company), are referred to in the Superintending Engineer's Report.

JUPITER GOLD MINING COMPANY, LIMITED.

Crushing operations were resumed on the 1st September, 1915, since when a dividend of 5 per cent. has been paid.

ROBINSON DEEP, LIMITED.

The Shareholders of the Robinson Deep Gold Mining Company, Limited, The Booyens Estate, Limited, and South Deeps, Limited, having approved the provisional agreement submitted to them at the Special General Meetings held on 11th November last, the Robinson Deep, Limited, was registered on the 31st December, 1915. Difficulties having arisen in connection with the use of No. 2 vertical shaft, arrangements had to be made for the transfer of operations to No. 1 shaft. Meanwhile the sinking of a seven-compartment vertical shaft on the former "Booyens" area was commenced, and at the end of July of this year this shaft had reached a total vertical depth of 529 feet, and sinking will continue to an estimated depth of approximately 4,500 feet.

SIMMER DEEP, LIMITED.

As will be seen from the Superintending Engineer's report, development disclosures indicate a slight upward tendency in value and a substantial increase in profit is expected for the ensuing year on account of an improvement in the grade of ore available for mining. A sale of 40 claims situated on the north-west boundary of this Company to the Simmer and Jack Proprietary Mines is in contemplation.

RHODESIA.

GOLD FIELDS RHODESIAN DEVELOPMENT COMPANY, LIMITED.

The Report and Accounts to 31st March, 1916, presented at the Annual Meeting of Shareholders of the Gold Fields Rhodesian Development Company, Limited, held on 27th July last, having disclosed material improvement in the financial position and in the revenue from dividends, but a heavy depreciation on its investments, resulting in the capital not being represented by assets, the Directors have suggested the desirability of reorganising this Company's capital in order that dividends may in the future be payable from the revenue now being earned. Formal proposals to this effect and for economy in administration will shortly be placed before the Shareholders.

The results of the principal crushing mines may be summarised as follows:—

Shamva Mines, Limited.

Four interim dividends, amounting to $27\frac{1}{2}$ per cent. were paid during the year ending 31st December last, since when three further dividends, amounting to $22\frac{1}{2}$ per cent., have been paid for the 9 months ending Sept. 30th last. The 5th level has at date disclosed 83,302 tons averaging 5.17 dwts. per ton, and a considerable extra tonnage of payable ore has been developed and drawn from the upper levels. The small amount of cross-cutting done on the sixth level has not as yet disclosed pay ore. A geological report on the prospects of the mine has been obtained from Dr. Constophine, who recommends systematic exploratory work on lines laid down by him, which will be followed as soon as the necessary labour is obtainable.

Antelope Gold Mine (Rhodesia), Limited.

The total returns from 1st October, 1915, to 30th September, 1916, give an estimated working profit, including sundry revenue, of £11,723, part of which is being utilised for the cost of sinking the Main Shaft to the 14th level, etc. The latest advices in regard to development are encouraging.

The Consolidated Gold Fields of South Africa, Limited.—continued.

Falcon Mines, Limited.

During the year to 30th June, 1916, 218,792 tons of ore were treated, from which 3,451 tons of fine copper, 36,777 ozs. of gold and 68,868 ozs. of silver were obtained, which it is estimated should realise £530,000. A satisfactory profit, the amount of which cannot as yet be ascertained, is assured. It is, however, estimated that the profits from outputs already declared will suffice to repay the floating debt which on 31st October stood at £88,500, and in addition the debenture indebtedness has been reduced from £250,000 to £216,463. Developments are satisfactory; the ore reserves at 30th June, 1916, being estimated at 862,066 tons of an average value of 5.8 dwts. gold and 2.69 per cent. copper.

Eldorado Banket Gold Mining Company, Limited.

The profit for the year ending 31st March last amounted to £62,000, out of which a dividend of 15 per cent. has been paid. The station at the 20th level (2,331 feet vertical depth) has now been completed and the drive west started to intersect the reef.

AMERICA.**GOLD FIELDS AMERICAN DEVELOPMENT COMPANY, LIMITED.**

The Report of the Chairman of the New York Committee of the Gold Fields American Development Company, Limited, which deals with its principal investments, records a satisfactory position despite the fact that many serious difficulties have hampered construction work during the past year, that the state of affairs in Mexico has not improved, and that the continuance of the war in Europe has caused an unexampled rise in the cost of stores and materials.

POWER COMPANIES.**Mississippi River Power Company.**

The earnings show a steady increase, the net earnings for the seven months ending 31st July, 1916, having been 792,227 dollars, as against 755,849 dollars during the corresponding period of last year. The Company's business is expanding and further increased profits are anticipated.

The Sierra Pacific Electric Company.

There has been an improvement in the earnings for the past seven months, viz.:—173,376 dollars, as against 155,000 dollars for the corresponding period during the previous year, and there is reason to believe this improvement will be maintained.

OIL.**Transcontinental Consolidated Oil Company, Limited.**

Although affairs in Mexico remain unsettled and this Company was obliged to accept a low price for its produce, mainly owing to the fact that its only tank steamer was taken over by the British Admiralty in December, 1915, the profits earned have been sufficient to pay the dividends on the Preferred Stock.

GOLD.**Natomas Company of California.**

The net operating profits for the year ending 31st December, 1915, closely approximated the previous year's results, namely, 1,570,799 dollars, as against 1,548,069 dollars. For the seven months ending 31st July 1916, the net operating earnings were 588,789 dollars, as against 737,984 dollars, the lower average results being principally due to a decline in gold dredging operations.

The Oroville Dredging Company, Limited.

For the year ending 29th September, this Company has paid quarterly dividends at the rate of 10 per cent. per annum. Two dredges continue work on the California Areas, and the returns made from the Pato Mines (Colombia), Limited, continue satisfactory. The average value of the ground for the year is considerably over the estimated value of the ground worked. The Nechi dredge started work in September, 1915, and has worked some unusually rich ground. The dredge, however, for the present is working outside the tested area, where lower value ground was anticipated, the results, however, so far are eminently encouraging, and indicate a larger area of payable ground than was originally estimated, and therefore a longer profitable life for the property.

Yuba Consolidated Goldfields.

This Company is now earning at the rate of about 1,800,000 dollars per annum, as against 1,374,868 dollars for the year ending February, 1916. The Management report that everything in connection with this property is in the best possible condition.

The Granville Mining Company, Limited.

For the 1915 season the output of gold of the Canadian Klondyke Mining Company, Limited, amounted to 72,464 ounces, compared with 66,189 ounces in 1914. The starting of the dredges this year and their operating efficiency were handicapped by the late deliveries of necessary repair parts, which were on a steamer wrecked last autumn. Up to the 9th September last 34,112 ounces have been produced.

The North West Corporation, Limited.

Shipping operations have been continued on Upper Dominion, Granville Flat and Quartz Creek, and for the year ending 1st August last, 779,000 cubic yards of overburden had been removed with a view to providing ground upon which the Excavator Plant can work continuously and to advantage.

POTASH, ETC.**Foreign Mines Development Company, Limited.**

The Report, which has been circulated to the shareholders of the American Trona Corporation, presents the position at date. The unabated confidence of the Company's representative in America and that of the technical staff in the prosperous future of this

concern leads the Directors to hope that the difficulties still to be overcome will in due course be satisfactorily solved.

WEST AFRICA.**GOLD.**

The shortage of freight and increased cost of supplies due to the war have adversely affected the profits from the producing Companies.

Abbontiakoon Mines, Limited.

The causes above referred to resulted in higher working costs. A dividend of 5 per cent., free of Income Tax, was declared up to the termination of the financial year.

Fanti Consolidated Mines, Limited.

A Maganese deposit on the Dagwin Extension Concession (owned by the Wassaw Exploring Syndicate, Limited), in which this Company is largely interested, has been traced over a length of upwards of 3 miles. Shipments of ore on a small scale have commenced, 709 tons being shipped in September. It is estimated that about 1,000 tons will be shipped in October, 1,500 tons in November, and 2,000 tons in December.

TIN.**Ropp Tin, Limited.**

The hydraulic plant has been installed, but the erection of dredges has been hampered by transport difficulties, and it is not expected that they will be in operation before early next year. Whilst the average output during the year 1915 amounted to 32 tons of concentrates per month, the average output for the first eight months of 1916 was 35 tons of concentrates per month. It is estimated that when two dredges are at work the monthly output will be increased to 135 tons. A dividend of 25 per cent., free of Income Tax, was declared during the last financial year.

OUTSIDE VENTURES.**PLATINUM AND GOLD.****Anglo-Colombian Development Company, Limited.**

The dredging operations referred to in the last year's Report having demonstrated that highly profitable results should be obtained by the working of the Company's properties on an adequate scale, the provision of further working capital was considered, and negotiations were entered into with Messrs. Lewisohn, of New York, who possessed similar dredging ventures in Colombia, with a view to a fusion of interests and thereby to a settlement of certain claims in dispute. The shareholders of the Anglo-Colombian Development Company have agreed to the proposed terms, which are satisfactory to the Company, and include the provision by Messrs. Lewisohn of 1,500,000 dollars for working capital and the registration of an American Company under their control.

OIL.**Trinidad Leaseholds, Limited.**

Drilling operations have been continued throughout the year with satisfactory results. Further tankage has been erected, a pipeline from the property to the coast has been completed, and an island jetty 300 feet long has been built a mile from the shore with which it is connected by a submerged pipeline, enabling vessels of deep draught to come alongside for the purpose of loading oil.

Two shipments of crude oil have been made since the completion of the pipeline, and besides sales of fuel oil to local consumers, a small bunker trade has been established. Twelve wells are now producing, and the output is approximately 1,400 tons per week. A topping plant is in course of erection, which is estimated to be able to deal with 250 tons per diem.

STAFF.

Owing to Mr. H. H. Webb having decided to reside permanently in America, his direct connection with the Company ceased on 31st December, 1915. He remains, however, as Consulting Engineer to the Gold Fields American Development Company, Limited. The Directors desire to record their appreciation of the valuable services rendered by him to the Company over a long term of years.

Since the commencement of the war 80 members of the staff in London, and 723 members from the Johannesburg Office and from the mines under the Company's control have joined His Majesty's Forces. The Directors regret to state that 6 members from the London Office and 30 members from the Johannesburg Office and mines have died in their country's service.

The Directors are pleased to bring to the Shareholders' notice the efficient services rendered by the Company's staff, to whose energy and ability, as in past years, so much is due.

RE-ELECTION OF DIRECTORS.

Sir Leigh Hoskyns, Colonel E. Frewen, and Mr. R. Maguire retire under the Articles of Association, and, being eligible, offer themselves for re-election.

AUDITORS.

The Auditors, Messrs. Turquand, Youngs and Company, retire and offer themselves for re-election.

For the Board of Directors,

HARRIS,

E. RIRKENRUTH, Directors.

HERRBERT C. PORTER, Secretary.

8, Old Jewry, London, E.C.

11th. November, 1916.

The Consolidated Gold Fields of South Africa, Limited.—continued.

Dr.	BALANCE SHEET, 30th JUNE, 1916.	Cr.	
CAPITAL AND LIABILITIES.		PROPERTY AND ASSETS.	
Capital Authorised and Issued—		Investments—	
2,000,000 Ordinary Shares of £1 each	£2,000,000 0 0	Shares in Companies at or under cost	£3,670,510 17 8
1,250,000 6 per cent. 1st Preference Shares of £1 each	1,250,000 0 0	Properties and Ventures	32,437 4 5
1,250,000 6 per cent. 2nd Preference Shares of £1 each	1,250,000 0 0	Investments on Account of Reserve	389,665 1 10
	£4,500,000 0 0		£4,092,613 3 11
Reserve, including Wasting Assets Account—		Pre-War Stock Exchange Loans	277,252 11 6
Invested in British and Colonial Government Securities, and the General Assets of the Company	800,000 0 0	Sundry Debtors and Dividends declared	171,212 1 8
Less Transferred to Profit and Loss Account	100,000 0 0	Cash Advances and Mortgages	530,969 8 1
	700,000 0 0	Real Estate and Buildings	88,014 4 11
Liabilities—		Office Furniture	5,085 15 5
5½ per cent. Debentures issued at 95, and redeemable at par, by 24 annual drawings, of which the twentieth is due 1st July, 1916	125,000 0 0	Stock and Sundry Assets	1,195 16 9
Simmer and Jack East 2nd Debenture Guarantee—		Treasury Bills	426,562 16 8
Value of Guarantee to 31st August, 1921, still outstanding	10,279 16 6	Cash at Bankers and in hand	171,500 18 3
Sundry Creditors	131,211 13 0		
Preference Dividends—			
Six months due at date, 1st Preference	30,103 11 0		
Three months accrued at date, 2nd Preference	18,750 0 0		
Debenture Interest—			
Six months due at date	2,759 15 11		
Proprietors' uncleared Warrants and Coupons—			
Debenture Interest	£125 14 7		
Preference Dividends	1,877 6 2		
Ordinary Dividends	12,558 19 1		
	14,561 19 10		
Profit and Loss Account—			
Balance at Credit	231,740 0 11		
Contingent Liabilities—			
Uncalled Capital on Investments, etc.	£669,875 9 6		
Note.—In addition the Company has guaranteed the following:—			
Principal and Interest of £24,400 Knights Deep, Limited, 5½ per cent. Debentures (since lapsed).			
Interest of £554,500 Simmer Deep, Limited, 5½ per cent. First Debentures for a period of 25 years computed from 1st October, 1906.			
	£5,764,406 17 2		£5,764,406 17 2

Dr.	PROFIT AND LOSS ACCOUNT, 1st July, 1915, to 30th June, 1916.	Cr.	
Directors' Fees, Engineering Department, Salaries, Office and other Expenses, London, South Africa, and Paris, less Amounts received from other Companies, including Transfer Fees... ..	£12,132 14 0	Dividends, Profits realised by Sales of Investments, and Sundry Receipts, less Net Commission and Amounts written off	£461,379 7 3
Subscriptions and Donations... ..	2,230 15 1		
Debenture Interest	6,875 0 0		
Balance carried down	440,140 18 2		
	<u>£461,379 7 3</u>		<u>£461,379 7 3</u>
Depreciation of Investments, etc.—Amount written off	£232,264 15 9	Balance brought down	£440,140 18 2
First Preference Dividend, 6 per cent. for year	75,000 0 0	Balance from Appropriation Account	80,088 1 3
Second Preference Dividend, 6 per cent. for year... ..	75,000 0 0	Amount taken from Reserve	100,000 0 0
French Government Duty and Stamps	3,899 3 7		
Income Tax—South African	2,324 19 2		
Balance carried to Balance Sheet	231,740 0 11		
	<u>£620,228 19 5</u>		<u>£620,228 19 5</u>

Dr.	APPROPRIATION ACCOUNT (Last Financial Year.)	Cr.	
Ordinary Dividend, 1s. 6d. per share, paid 15th December, 1915	£150,000 0 0	Balance at Credit of Profit and Loss Account, 30th June, 1915	£230,088 1 3
Balance carried to Profit and Loss Account	80,088 1 3		
	<u>£230,088 1 3</u>		<u>£230,088 1 3</u>

HERBERT C. PORTER, Secretary.

HARRIS,
JAMES PRINSEP, Directors.

We report to the Shareholders that we have obtained all the information and explanations we have required as Auditors. We have examined and compared the above Balance Sheet with the Books and Vouchers of the Company in London and the Accounts received from South Africa. The investments, after making such provision for contingencies as is considered necessary by the Directors, are taken at or under average cost price, and in no case over market prices where quoted on 30th June last. The profit on investments is generally arrived at by deducting the average cost price of the Shares sold from the proceeds, and no increase in value over average cost is taken into Profit and Loss Account. In our opinion the Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of the Company's affairs at 30th June last, according to the best of our information and the explanations given to us, and as shown by the Books of Company.

London, 7th November, 1916.

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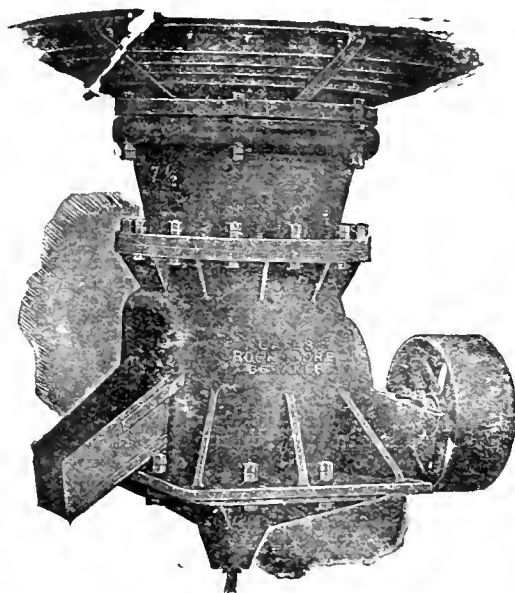
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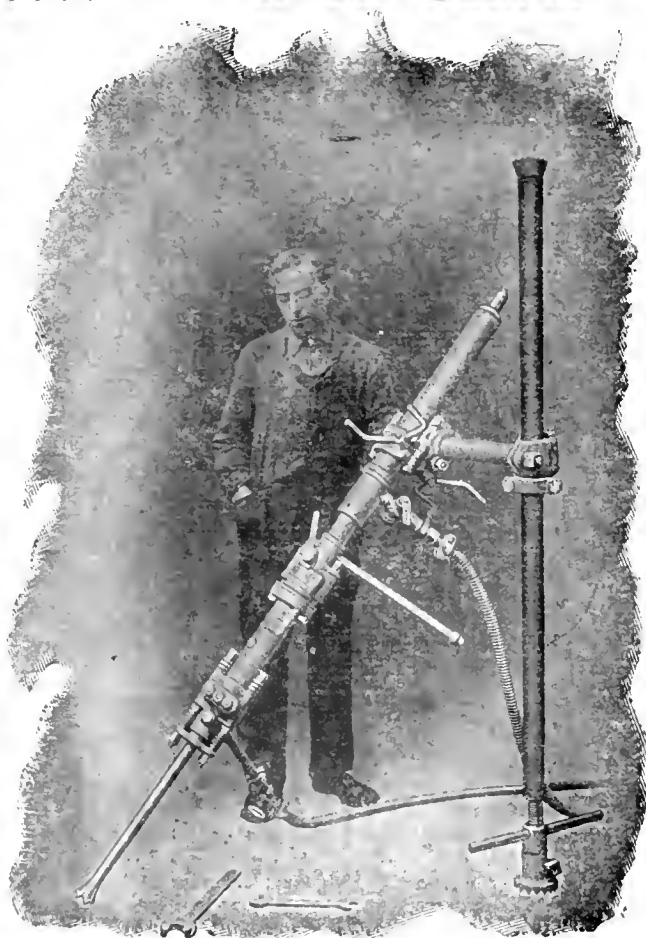
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THE SOUTH AFRICAN
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Notes and News

The latest news from Springs Mines is very satisfactory, and there is good reason to believe that crushing will begin during the first few days in January. The permanent hoist for the No. 2 shaft has been shipped, and its arrival should be of considerable assistance. It is hardly likely that any crushing return will be made before February.

* * * *

The reduction in the rate of the Consolidated Main Reef dividend is due to the heavy capital expenditure which the Board considers advisable to provide out of current profits. The question was dealt with in the chairman's speech at the annual meeting held on the 26th November, 1915, and still more fully explained by him at the annual meeting held on the 24th November last.

* * * *

The report of Balkis, Limited, for the year to August 31st last states that the income derived from rents, interest, dividends, and transfer fees amounted to £1,424, and £1,305 was brought in, making £2,729. Deducting expenses, there remains £1,098, which is carried to balance sheet. The property account, which is represented by about 285,000 acres of land in the Transvaal, an undivided moiety of about 43,000 acres of land in South Rhodesia, known as the Kanya block, and mining concessions in the Bangwaketsi Reserve of the Bechuanaland Protectorate, giving extensive rights of selection for mining exploitation over 9,000 square miles of territory, stands at £73,855.

* * * *

On the 16th November the Mining Conference resolved to form a central body to be called the Rhodesian Mining Union, to which all Mining Chambers and Associations in the country can belong. A Committee was appointed consisting of one member from each of the Rhodesia and Salisbury Chambers of Mines, and from the Rhodesian Small Workers' and Tributors' Association, for the purpose of drafting Rules and Regulations for the Union. The head office of the Union will be the Chamber or Association situated in the town where the annual conference is held, and such Chamber or Association will continue to act as the head office until the next conference. The President of the Rhodesia Chamber of Mines has been appointed as the representative of the Chamber on the Union Committee.

* * * *

One of the chief subsidiaries of Henderson's Transvaal Estates, Ltd., the Delagoa Bay Development Corporation, did a little better during the year ended June 30. A profit was earned of £3,060, against £2,370 for 1914-15, and there is, therefore, £10,549 to be carried forward, against £7,430 brought in. The fall in exchange value of Portuguese currency continued during the period, and as the directors do not anticipate a substantial recovery during the war they regret that once again they cannot see their way to recommend a dividend. For each of the three financial years prior to the war 3 per cent. was paid, but there has been no distribution since. The corporation's chief assets are the waterworks and electric tramway at Lourenco Marques, and it also owns land and other rights in the same port. Doubtless after the war, when shipping and other business become something like normal again, it will in due course re-enter the dividend-paying ranks.

* * * *

The report of the Mayo (Rhodesia) Development Company (1908) for the year ended 31st July 1908 states that the Company owns 376 claims, 10 claims having been acquired during the year and 20 abandoned. In addition to the claims, buildings, plant, etc., at the close of the financial year, the company held £22,610 investments

at cost, £132,461 shares and debentures in other companies at cost, and had £594 at bankers and £13,331 on loan against securities. The loans from bankers and others owing by the company amounted to £31,844. Owing to the restriction in market dealings it is difficult to ascertain the quoted prices of some of the investments, shares and debentures. With regard to the investments—namely, £22,610—about 89 per cent. of these show a deficiency of about £3,400. The shares and debentures stand in the balance-sheet at their book cost—namely, £132,461. About 44 per cent. thereof were quoted at 31st July last, and on this proportion there is a depreciation of about £19,400.

* * * *

The report of the Jumbo Gold Mining Company for the year ended 30th June states that 20 stamps were working from July, 1915, to February, 1916. In March this was reduced to 10, since which time only 5 stamps have been in operation. During the year 22,100 tons were crushed, yielding bullion valued at £26,139, while the working costs were £26,308. Up to 30th September, 1915, 1,670 tons were crushed, producing 620 ozs. of fine gold. This makes, since crushing commenced in May, 1906, a total of 146,914 ozs. of fine gold, which has been sold, together with about 39,000 ozs. of silver, for the sum of £624,098. The engineer in his report states that the position is, that he is cleaning up everything, removing and treating all ore left, and at the same time a small amount of development work is going on at two points where the results are good enough to repay for the work. The Company cannot expect to continue milling for more than another month or two unless something most unexpected happened. The Company is able from time to time to improve its cash balance by occasional sales of machinery and plant. The Directors propose that the 30,000 unissued shares of £1 each be consolidated in such manner that every three such shares constitute one share of £3.

* * * *

A recovery in receipts and profit is reported by the Directors of the Oceana Consolidated Company for the year ended June 30th.

Oceana Consolidated. The revenue was all but £25,000, against £15,000 for 1914-15, and the net profit £17,700, against £6,300. The balance at profit and loss account of £24,075 hardly, however, permits of the shareholders looking for early substantial dividends on the large issued capital of £512,632 in 5s. shares, particularly as the Company has borrowed over £110,000 against securities. No fresh schedule of investments is presented this time, but it is stated that no material alteration has occurred in the Company's holdings during the past year and they are valued by the Directors (without apparently any provision for depreciation) at £315,500. The most important asset, the land owned in the Transvaal, which covers well over 1,000,000 acres, is entered in the balance-sheet at £234,000. This valuation is based on one made in March, 1913, "by the most competent authorities then available," less sales effected since. In existing circumstances the directors contend that it could not be expected that any important sales of land would be made during the year, but they see no reason for changing their previous opinion that, upon the termination of hostilities, there will be a general increase in the demand for agricultural and pastoral ground.

* * * *

The Manager of the Haenertsburg Gold and Copper, Ltd., reports as follows on the results obtained by amalgamation, for the three months ended November 30:—

	Tons mined.	Tons sorted.	Tons milled.	Gold fine ozs.	£	s.	d.	Days of 24 hours
September	110	5	105	2471	103	15	2	5.1
October	105	0	105	2512	105	10	7	4.0
November	216	10	176	65.3	277	10	0*	6.2

* Adjustable.

The development footage was as follows: New Reef North, 23 feet; New Reef South, 16 feet; Never Despair Winze, 31 feet; Never Despair South, 35 feet; Iron Crown north of

dyke, 15 feet; Iron Crown south of dyke, 11 feet; Jamebo, south of dyke, 7 feet; southern exploration, 15 feet; total, 153 feet. Taking these development faces in order, the New Reef North has been faulted off and on for its entire length, but now appears in more settled country. Samples taken at the face assay 4.56 per cent. copper and 87.2 dwts. gold, width of sample 10 inches. The New Reef South continues good, the average of a composite sample (10 samples) being 5.07 per cent. copper and 81.6 dwts. gold, distance 25 feet, width 7 inches. At the face 13 per cent. copper and 12.4 dwts. gold, width 8 inches. The Never Despair winze for 35 feet assayed for two composite samples and cheek assays, 49.5 dwts. over 24 inches, and at the bottom 105.6 dwts. over 24 inches. The Iron Crown north of dyke gives exceptionally fine pannings, but is still in unsettled country. The Iron Crown south of dyke is very poor, although there is a fine ore body. The value at face is only 0.5 dwt. The Jamebo Reef south of dyke is also poor, but there is a flat body lying across it, which assays 4.72 per cent. copper and 9.9 dwts. gold over 24 inches. The southern exploration was done on a reef which gives good pannings of rusty gold. It is beyond my power to say whether this will lead to anything or not. The above development may be considered quite satisfactory, the only unpayable face being the Iron Crown drive. The effect of these rich strikes can be seen by the increased milling returns. This month is rather doubtful. We are still short of water, and with the Christmas holidays on us, it is doubtful what can be done in the way of tonnage, on account of the natives being inclined to go to their kraals! In connection with the above it should be noted that previous experience has shown that only one-third of the gold contents of the ore is recovered over the plates, the remainder going to the concentrates, which are being stored and gradually treated. The fact that the mill ran for so short a period each month was due to the shortage of water.

* * * *

The following statement has been cabled to the London office of the New Kleinfontein Company:

New Kleinfontein Dividend Passed. The directors regret financial position of company does not permit declaration of December dividend. Year's profits, estimating December, £202,000, but it has been necessary to finance out of current profits construction of new plant, large proportion of which dealt with during the year, and development of Apex section of mine. Profits earned for the year ending 31st of December will be appropriated approximately as follows:—June dividend, £57,577; capital expenditure, £108,900; taxation, interest, etc., £35,523. Labour conditions second half of the year have been unsatisfactory, preventing attainment of maximum crushing capacity. This, together with additional expenses due to war conditions, has imposed heavy burden on the company in connection with starting Apex mill. Impossible at the moment forecast any degree of certainty when the labour conditions will improve sufficiently to allow reduction works crushing full capacity; directors, therefore, consider that best interests shareholders served by passing dividend.

* * * *

The announcement referred to in our last issue that the Railway Administration has under consideration the question of electrifying certain sections of the railway system, revives a project which has been dormant since the outbreak of the war; but was being increasingly urged upon public attention during 1913 and 1914. The general electrification of the entire railway system in South Africa, is not, of course, in contemplation, though even heavy long distance traffic may in the not distant future be carried over electric railways. The more immediate question is the electrification of short sections such as the Wynberg line, the Sea Point railway, the Springs-Randfontein line on the Rand, and some of the short distance railways in the neighbourhood of Durban and Maritzburg. The *Cape Times* says that probably the Simonstown line would have been converted many years ago had it not been for the technical controversy which has arisen between the champions of the single phase and direct current systems, a controversy which is still unsettled,

the essential point at issue being the relative costs. In South Africa the more general question upon which expert decision will be required is as to the relative cost of the present system of coal-fed engines and that of electric traction. On the Simonstown and Sea Point lines the conditions would appear to be specially favourable for electric traction. All coal employed on those sections has to be hauled from the collieries in the North or from Natal, the fuel for the service of the locomotives being thus at its costliest point in the Cape Peninsula. The traffic conditions on the same sections correspond more closely than in any other part of South Africa to the conditions ruling around London, where the suburban lines have long been successfully electrified, and as regards speed and comfort for passengers there can be little doubt that on short hauls at any rate the electric system has the advantage. Another interesting point in connection with the suggested conversion would be whether the Railway Department would generate its own current for the purposes of the railways or would purchase it from the power companies and local authorities. We hope to return to the subject shortly.

* * * *

At the meeting of Henry Bull and Co., in London, on November 8th, the Chairman pronounced the taxation measures now current to be so unbearable that, unless complaints were attended to, it would be impossible to carry on the Company's business any longer from London as its headquarters, and would be necessary to transfer the control to Australia, and re-register the Company as an Australian undertaking. The Company is registered in England, and the board sits in London, but the active business of the Company is in Sydney, the London office being principally engaged in buying and shipping goods required for the Sydney business. The Chairman said:—

Double Income Tax.

I have availed myself of every opportunity to protest against the profits made by our company in Australia being subject to income tax there and income tax in Great Britain. The principle of taxation in the United Kingdom is that income tax should be levied on all persons, companies and businesses resident and domiciled in the United Kingdom, irrespective of the source from which the income is derived or where business is carried on. The principle of taxation in the Dominions is different. There the tax is levied only on property or businesses within the jurisdiction of the taxing authority. The Dominion taxation is fair, that of the United Kingdom is not. Prior to 1914, income made in Australia and not remitted to Great Britain was exempt from taxation in Great Britain; now the position is altered. Persons resident in Great Britain who have never received a penny of the money in Great Britain are now required to pay income tax upon it. It is quite impossible for a company which pays two income taxes and also excess profit taxes to compete successfully with another company carrying on the same kind of business, possibly next door, which only pays one income tax. A number of companies which had their head offices in London have decided to remove from London elsewhere, and it may be that we shall be forced to do the same. I have only touched upon the subject to-day with a view to impress upon you the importance of attending the meeting, when it is called, for the purpose I have indicated. I do hope, however, that in the meantime the Chancellor of the Exchequer will see how important it is that our fair and just demands should be met and not leave matters in abeyance till it is too late.

* * * *

Following the meeting of the iron and steel trade at Birmingham in mail week, at which representatives from all parts of the country attended, the Ministry of Munitions have issued a most comprehensive list of extras in the trade. The list embraces not only extras for rolling sizes, but also for analyses, tensiles, cold straightening, reeling, oiling, etc. The list being issued under the Defence of the Realm Regulations, absolutely fixes the price of rolled material and leaves very little room for bargaining of any sort. It is quite clear from reading it that an immense amount of work has been put into its compilation, and while no one is particularly pleased at having the prices at which they must sell settled for them down to the fraction of an inch, the issue of the list secures at once a uniform scale for extras throughout the country provided that all makers adhere to it, as no doubt they will. By law they cannot sell over the list, and by agreement they will not sell under it. It is understood that the conference of representatives of the trade associations of the various iron producing districts, which was held in Birmingham in mail week to consider the abolition of discounts and the uniformity of "extras," was successful.

TOPICS OF THE WEEK.

THE BARNATO-ROBINSON DEAL.

WE are officially authorized to announce that the negotiations between the Johannesburg Consolidated people, through the Chairman, Mr. S. B. Joel, and Sir J. B. Robinson, have been successfully completed, and the controlling interests of the latter in the Randfontein and Langlaagte Estate mines have passed into the hands of the former. As there is some misconception on the point, it should be made clear that the deal is understood to embrace Sir J. B. Robinson's personal interests in the properties in question, and does not, of course, mean that the interests of all the shareholders have been purchased outright. As it is, the deal is one of the largest ever carried out in the history of the Rand, and it involves the transference of the big Randfontein producer, together with the Langlaagte Estate, to the Barnato group of mines. A map of the Randfontein properties, compiled from the latest official Chamber of Mines data, is reproduced in this issue, and a glance at it will illustrate some of the possibilities of the deal. Thus it is clear that with both the Randfontein Central and Randfontein Deep properties under the same control, the long-deferred scheme to unite them may not, in the interests of both, be much further delayed. The Randfontein Deep property of 1,256 claims and two water-rights, lies on the dip of the richest section of the outcrop property, and, despite the steepness of the reef in the district, the possibilities of a union of the areas are highly attractive. Again, the passing of the control of the Langlaagte Estate into Barnato hands opens up possibilities of the fusion of the Consolidated Langlaagte, the Block B. (which is, of course, now part of the Langlaagte Estate) and the Langlaagte Estate, making one large and promising "proposition," covering all the ground between the Crown Mines on the east and the Consolidated Main Reef on the west. We do not say that such a merger is contemplated, but it is an interesting possibility. It would seem from all this that Sir J. B. Robinson, who has long elected to plough a lonely furrow in regard to most Rand affairs, has disposed of all his gold mining interests, and it will be found, we believe, that he has retained only the property and assets of the O.F.S. and Transvaal Diamond Company, Ltd., which, it may be remembered, he bought in some time ago from the liquidators of that unfortunate concern. The refusal of Sir J. B. Robinson to co-operate with the activities of the Chamber of Mines or in native labour recruiting has long been a source of weakness to all parties concerned; and the industry, as a whole, has therefore everything to gain from the change. It is scarcely likely, of course, that the globular amount involved in the acquisition of their new interests by the Barnato group will ever be made public, though it may be guessed that, despite the world-wide distribution of the shares and debentures in the two big Randfontein companies, it runs well over seven figures. From the public point of view, there is, of course, every reason to welcome the passing of the control of these large factors in the industry into the keeping of a progressive and enterprising group; and the shareholders, by the recent appreciation in the quotations for the shares and debentures in the companies concerned, have already testified, in their own way, their hearty approval.

RAND INDUSTRIAL QUESTIONS.

FOUR questions of unusual interest engaged the attention of the President of the Chamber of Mines at the quarterly meeting this week. What the President had to say on the subject of the native labour supply was entirely satisfactory, a noteworthy increase in the number of boys from the East Coast having enabled the extra requirements of the coal mines to be met, and helped at the same time to augment the Rand native labour force. Mr. Wallers did not take a strong line in regard to the recruiting of South African

natives for work in Europe, but he made it clear that from the experience the Rand has had of both Chinese and South African native labour, the former was more likely to prove suitable under the climatic conditions of Northern Europe. Without expressly dealing with the matter, the President made it plain that there was no basis of truth in the remarks of some of the London papers in regard to the Rand being willing to postpone its interests to those of the Allies in connection with native labour. It would seem from the President's remarks that the matter has, as a fact, hardly been discussed.

The question of returning soldiers was dealt with very fully by Mr. Wallers; and it will be seen that the attitude of the Chamber of Mines is one of characteristic forethought and liberality. So far from leaving everything to the Government, the industry has set about making every possible provision for the return of invalided soldiers and for the re-employment of the able-bodied. Hospital accommodation is being provided through the efforts of the V.A.D. organisation and the mines; and nothing is being left undone to redeem in part the debt the community owes the brave fellows who have fought our battles in the fever-stricken swamps of East Africa.

Mr. Wallers went on to describe the extended system of training young South Africans to become skilled miners that has lately been adopted. All the groups, with the temporary exception of the Robinson, have combined with the Government in the matter; and a thorough and well-co-ordinated miners' training school is thus at last to be introduced on the Rand. As the plans set forth by Mr. Wallers take shape we hope to return to them and to report from time to time the progress made. Lastly, Mr. Wallers made an interesting reference to the formation of an Industrial Bank or Finance Company. He made the welcome announcement that four of the mining houses in conjunction with the Standard and National Banks have agreed to finance the undertaking in question, and that a limited liability company was now being formed to give effect to that agreement. He mentioned the names of three leading Rand business men as directors of the concern; and they will doubtless have the assistance of direct representatives of the financial interests concerned. The institution could hardly start under better auspices; and if its future is not of the brightest, the fault, at any rate, will not lie with its directors or its backing. It may be of interest here to quote the words in which Sir Lionel Phillips suggested the aim and function of the projected enterprise. Speaking at the last annual meeting of the Chamber of Mines, he said:—

There are not many experts in special industries, and there has been some paucity of capital for industrial enterprises outside mining. If you attempt to start enterprises outside mining, whether it be boot-making, tanning or anything else, I am satisfied that you will make a failure of it, because your business is gold mining. If we attempt—and I have had experience of it—if we attempt to start new industries which we do not understand, we have, of course, an imperfect knowledge of everything, and we are bound to fail; but because that is the case I don't think it follows that we cannot do anything to foster industry. I think we can, as a gold mining industry, do a great deal, in fact my friend Mr. Inroth, in a recent speech, referred to this question. Since I have been out here, I have read a great deal on the subject, and, among other pamphlets, I read a very thoughtful one by Mr. J. M. Buckland. I should not be prepared to agree with it in all respects, but there was one thing that struck me as having great point in it, and as entitled to your very earnest consideration in this Chamber hereafter, and that is the question of establishing in this country an industrial bank. An industrial bank, if one were started here, could be begun upon a modest scale and it could be run upon absolutely business lines, so that the money which is put into this institution may be safe. I do not believe that industry is going to be safe unless money advanced to it is advanced upon sound business lines. There are many cases of struggling little factories, where a little help, wisely and soundly given, would be the means of putting those enterprises upon a much more sound and extensive scale and achieving that object you have in view. I would urge you very strongly to appoint a committee of your body to consider this question very carefully, in conjunction perhaps with other financial institutions in the Transvaal. There is no reason why the banks, which, of course, conduct their operations upon purely banking principles, should not put a small proportion of their reserve funds into an industrial bank, managed by a competent man and absolutely run upon strict industrial and sound commercial lines. If you take this matter up with that capacity and that energy which you have in this Chamber, you will put it through with enormous advantage to the gold mining industry and to South Africa as a whole, and to the great benefit of people who are now seeking employment.

The excellent suggestion of Sir Lionel Phillips, the credit for which he so frankly shared with Mr. Inroth and Mr. J. M. Buckland, is now, therefore, about to bear fruit; and of the multirarious activities promoted at one time or another by the Chamber of Mines, few have promised to yield more directly favourable results for the country.

TIN GEOLOGY.

THE recent closing down of the mill of the Zaaipplaats Tin Mining Company, and the somewhat sudden decision to start it again, which has ensued upon the discovery of further supplies of ore in the development faces, together with the statements made in the last Rooiberg report to the effect that the quantity of ore showed signs of diminishing in depth, has once more drawn attention to the peculiar geological conditions of the Transvaal tin deposits. A few years ago, in a series of articles on tin occurrences which were published in the *S.A. Mining Journal*, the question of the permanence in depth of these occurrences was discussed at some length. The history of the Transvaal Consolidated Lands properties in the neighbourhood of Zaaipplaats, and the record of other less important concerns in the same district, not to forget the case of the South African Tins, a little further towards the south-west, are sufficient to show that this problem of continuity of values has, almost from the outset, been of much more than academic interest. It is a matter for regret that, apart from the articles already referred to, no important investigation of the question has so far been entered upon. In papers upon the geology of the various mines in the country reference has usually been made, somewhat briefly, to the deep-seated origin of the mineral contents of the lodes. Two contributions to the literature of the subject stand out prominently, those of Messrs. Recknagel and McDonald, but they are almost entirely concerned with the characteristics of the lodes described as far as they are actually in evidence. From a purely scientific standpoint they are admirable, but from the economic side they leave much to be desired. A study of existing conditions is, of course, the first step towards a clear understanding of more remote problems such as those which are pressing for a solution, and that this step has been taken encourages us to suggest that the investigation might very usefully be continued by some one with as little delay as possible. In the present condition of the Geological Survey, under-staffed and suffering from the prevailing necessity for economy, it is too much to expect that the Government can voluntarily undertake such an enquiry. It seems, therefore, that it is a case for the consideration of those more directly concerned. That the board of the Zaaipplaats Company has taken this view of the position is apparent from the fact that Dr. Corstorphine and Mr. McDonald have been commissioned to deal with the particular question to which we have referred. The behaviour of the ore bodies as they continue in depth, and more especially their relationship to the pegmatite sheet which has clearly had a directing influence upon the movements of the stanniferous vapours at the surface of the tin-bearing granite, are to be carefully studied. The part played by the fissure system, and the process by means of which the fissures have been filled with ore, are also matters which will obviously demand careful investigation. The novelty of the enquiry as far as South Africa is concerned, inasmuch as it is one which deals with a geological problem from a standpoint which is essentially economical, is a circumstance that will endow it with special interest, apart from that which will naturally be taken in it by the company itself. To a great extent an enquiry of this kind cannot well be taken by a Government department for reasons which will doubtless suggest themselves. Mr. McDonald, who has already spent considerable time and devoted a good deal of work to an investigation of some aspects of the Transvaal tin occurrences, is already well equipped for the business in hand, and with the direction and collaboration of Dr. Corstorphine, who is primarily responsible for the carrying out of the enquiry, should be able to throw a valuable light upon the Zaaipplaats problem and at the same time upon the economic character of the Bushveld tin deposits generally.

THE YEAR'S TRANSVAAL GOLD MINES DIVIDENDS.

The following table shows the dividends declared by Rand and outside gold mining companies to date for the year, the half-year just completed, together with the total rate of

dividends for the year and the two preceding years. The complete list will appear in our next issue.

Company.	June Rate.	December Rate.	On Issued Capital. £	Total Rate% 1916.	Total Rate% 1915.	Total Rate% 1914.
Brakpan Mines	22½	22½	750,000	45	40	30
City and Suburban	6½	6½	1,360,000	12½	13½	15
City Deep	22½	22½	1,250,000	45	33½	23½
Consolidated Langlaagte	12½	10	950,000	22½	25	20
Consolidated Main Reef	6½	5	924,361	11½	12½	11½
Crown Mines	25	25	940,106	50	65	85
Durban Roodepoort	10		125,000		25	25
Durban Roodepoort Deep	2½		110,000		7½	7½
East Rand Proprietary Mines	2½	—	2,115,897	2½	11½	17½
Ferreira Deep	22½	16½	980,000	38½	42½	75
Geduld Deep	12½	12½	585,753	25	20	18½
Geduld Proprietary	5	5	970,000	10	10	5
Ginsberg	7½	7½	210,000	15	15	17½
Langlaagte Estate	5		886,500		15	10
Jupiter	3½	3½	1,011,200	7½	—	—
Knights Deep	7½	10	713,526	17½	15	10
Luipaardsvlei Estate	2½	2½	472,012	5	3½	—
Meyer and Charlton	45	55	200,000	100	80	70
Modder B.	37½	10	700,000	77½	67½	55
Modder Deep	30	37½	500,000	67½	35	—
New Goch	5	5	550,000	10	10	—
New Heriot	35	35	115,000	70	75	65
New Kleinfontein	5	—	1,151,510	5	10	10
New Modderfontein	16½	16½	1,100,000	32½	32½	30
New Primrose	5	5	325,000	10	17½	40
New Unified	10	10	250,000	20	20	20
Nourse Mines	5	6½	827,821	11½	10	17½
Robinson	1	1	2,750,000	8	11	28
Simmer and Jack	3½	3½	3,000,000	7½	10	10
Rose Deep	15	11½	700,000	26½	32½	25
Van Ryn	17½	17½	500,000	35	40	45
Van Ryn Deep	20	20	1,136,892	10	32½	25
Village Deep	8½	10	1,030,671	18½	21½	21½
Village Main Reef	10	15	172,000	25	20	70
Witwatersrand	25	25	169,625	50	50	50
Wit. Deep	12½	10	550,000	22½	28½	32½
Wolluter	7½	7½	860,000	15	12½	12½
Sub Nigel	5	5	131,580	10	2½	5

Miscellaneous Dividends.

The Rand Mines, Ltd., has declared a dividend of 75 per cent., or 3s. 9d. per share.

The African and European Investment Company is still marking time, especially in regard to its important land assets, which are valued in the balance-sheet as at June 30th at no less than £676,750.

Revenue during the past financial year improved slightly to £16,600 and expenses were somewhat reduced, with the result that the directors are able to report a profit, which, although only £200 in amount, at any rate compares satisfactorily with the loss of £3,100 experienced during 1914-15. The debit balance at profit and loss account is accordingly reduced to the merely nominal sum of £37. The Company holds more than 1,070,000 acres of land, and has mineral rights over an additional 5,500 acres. It has also a large shareholding in the Bechuanaland Farms, Ltd., which owns 326,600 acres in British Bechuanaland and some property in Capetown. The directors are very optimistic as to the ranching possibilities of the colony and express the hope that "the meat export trade and the dairying industry will, in the course of the next few years, establish themselves as two of the most important industries in South Africa." No change has been effected in the Company's shareholdings, mostly in members of the Lewis and Marks group, during the past year. The East Rand Mining Estates, Vereeniging Estates and Union Steel Corporation (of South Africa) interests are considered of considerable potential value.

Results of researches extending over many months at the South African Institute of Medical Research are set forth in a publication which has just been issued by the Institute under the title of "An Experimental Study of Prophylactic

Inoculation against Pneumococcal infection in the rabbit and in man." The pamphlet, which runs to 57 pages, is of a highly technical character. "Prophylactic inoculation" implies inoculation which will "protect against the disease, and furthermore that the disease known as pneumonia is merely one of the forms of infection of the body by the bacillus known as the pneumococcus. Almost every page of the pamphlet bears evidence to prolonged and patient experiments, and one concludes that a considerable bulk of entirely fresh knowledge concerning pneumonia infections has been acquired. The work of which the publication is the outcome was undertaken with the particular object of investigating the possibility of conferring upon man immunity against lobar pneumonia, and how important this is to South African mining communities, to go no farther afield, may be judged from the fact that even in years of least prevalence lobar pneumonia probably accounts for more than 30 per cent. of the total mortality amongst native mine labourers, in the worst years contributing 50 or even 60 per cent. of the total mortality. Of such vital consequence is the whole matter, that Sir Ahuroth Wright, with his co-workers, Drs. Parry Morgan, R. W. Dodgson and L. Colebrooke, carried out investigations in Johannesburg at the end of 1911, and throughout 1912. The present work started at the point where Sir Ahuroth abandoned it at the close of 1912.

PROSPECTS OF THE OPHIR GOLD MINES.

Points from Engineer's Report on the Latest Outside Flotation.

In the course of his report on the gold claims near the Tsama River, Northern Transvaal—now being floated as the Ophir Gold Mines—Mr. W. T. Hallimond writes:—

The property now consists of 328 claims, held under base metal licences, at 6d. per claim, as permitted by the Government. The claims are situated on proclaimed Government ground in the mining district of Pietersburg, in the Northern Transvaal, Union of South Africa. The property is a very short distance from the Tsama River, a tributary of the Klein Lataba, which river empties itself into the Great Lataba River in a south-easterly direction. The nearest railway station on the Pietersburg-Mossina line is Louis Trichardt, which is about 70 miles distant. Good hard roads for motor or heavier traffic exist over the entire distance.

Geological.—The gold reefs disclosed on the ground are found in the formation known as the Swaziland System, consisting of micaceous schist and gneissoid beds. The dip of these rocks varies considerably from about 50 degrees to vertical, and the strike through the ground is almost north and south. There are, as proved at the present time, several distinct quartz veins, all in parallel strike, but the two principal ones, the most eastern and western, are the payable gold carriers. The gold in the ore is free from pyrites or other sulphides. It is highly crystalline, and is found generally in very coarse nuggety particles. The original constituents of the rock mass, in my opinion, must have been of a highly ferruginous character, and through extensive chemical alteration, the gold was probably deposited simultaneously with the removal of the original iron. There is also evidence of pegmatite veins, which may probably have been a later intrusion into the older rocks. The conclusion arrived at, therefore, is that the space now occupied by these veins was caused by intense internal pressure, allowing of the easy ascent of auriferous solutions, when some of the original basic constituents of the rock were removed from the mass, and the gold simultaneously deposited. The conclusion to be drawn from such conditions of origin is that permanency of value in depth can be confidently looked for.

Prospecting Work.—A great amount of work has been accomplished, especially in the reefs already referred to as the principal gold carriers, viz., the "Ophir" and the "Courtney" reefs. Numerous shafts have been sunk and cuttings excavated, exposing the reef and "rubble" at different points along the strike. These will be best followed by a reference to the accompanying sketch plan, and it is from the reef exposed by this work that samples for panning and assay have been taken.

Tonnages and Values.—It is impossible at the present stage to make any correct calculation of available tonnage of ore. This can be done when mine development is undertaken and the reefs properly blocked out. An estimate, however, of the tonnage per claim area is quite possible with the data at hand from the shafts and other prospecting work which has been carried out. Taking the angle of dip at 50 degrees only, and the thickness of the reefs at 36 inches would, after making due allowance of 20 per cent. for possible dykes, faults and loss in working, etc., give a tonnage per claim for both reefs, say, of 39,800 tons per claim. Prospecting work has disclosed the reefs in such well defined lines of strike that leaves no doubt of their existence throughout the whole length of the claims, and the values, from the samples taken from the reefs in shafts, cuttings and old workings, are so consistent that I can come to no other conclusion than that you have payable chutes of free milling ore on both the "Ophir" and "Courtney" reefs extending over the whole of the property. During the carrying out of prospecting work in recent months along the line of the "Courtney" or West reef, considerable masses of broken quartz or "rubble" (not water worn, but still retaining their sharp edges on every fragment of broken rock) have been found just beneath the surface of the ground. These masses of "rubble" begin at where the solid reef is found out, cropping at the surface, and extend in varying distances towards the west of from 200 to 300 feet. The inference is that in process of erosion of the surrounding schists, the vein, which at one time was the centre of a small range of hills, has gradually settled over into the mass of broken quartz or "rubble" which now lies in its horizontal position immediately to the south and along the line of the West reef. Sampling of the "rubble" has proved it to be precisely of the same nature as the quartz in the reef. The values disclosed are exceptionally rich, as proved both by the panning and assaying of numerous samples. With regard to the quantity of "rubble" likely to be found, it is at present impossible to calculate with any degree of accuracy. The average thickness, however, as far as it has been opened up is 18 inches; and this calculated for the area of one claim would give a tonnage per claim of 6,000 tons. The reef from which the "rubble" originates has now been proved along its strike through 40 claims, so that should the "rubble" exist over the area of even only half a claim for this distance it would be equal to a tonnage of 120,000 tons. This "rubble" or loose rock, lying as it does practically on the surface, without any overburden, can be excavated and transported to the present mill site (1,000 yards away) at just over 2s. per ton. The values of the "rubble," as shown by both panning and assays, have been exceptionally high. By eliminating all values over 25 dwts., and there have been many such, the value of the "rubble" can safely be estimated at 1 ounce to the ton; so that by allowing a much larger working cost than that already mentioned, making it 7s. 6d. instead of 2s. per ton, would still leave the very handsome profit of £4 per ton. I may mention that the results

of the first short run of the new five stamp mill have just reached me and I consider them very satisfactory. Summarised they are as follows: Tons crushed, 17½ tons; gold recovered by amalgamation only, 15 ounces; gold absorbed by setting of plates, 2½ ounces; total, 17½ ounces. This gives just one ounce per ton milled, but as there must still be more gold in the mortar-box, and as I have not yet received the assay of the tailings samples, I consider that one ounce to the ton under the conditions as shown is a very satisfactory result indeed. The whole of the 17½ tons milled was from "rubble" excavated from the digger's claim and near it, on the West or "Courtney" reef. Numerous samples from both reefs have been carefully taken, the result of which by panning estimate gave 589 inch-dwts., or 16·3 dwts. over 36 inches. I must mention that the samples assayed were not duplicates of those estimated by panning, and also that no samples were either panned or assayed which contained any visible gold, although countless samples of the latter may be picked up both in the solid reefs and also in the "rubble."

Working Facilities.—By a careful laying out of the main shafts and connecting crosscuts, both the "Ophir" and "Courtney" reefs can be worked to one main hoisting shaft. Mining charges should not be more than the average on the Witwatersrand; as, even if a little more is required to be paid for white labour, it will be more than compensated for by cheaper native labour and mining timber, there being in the immediate vicinity a plentiful supply of both. The Tsama River, within 1,000 yards of the claims, has a never-failing supply of water, in addition to any that may be pumped from the mine. Reduction charges should be less than on the Rand mines. There is nothing refractory in the ore, and owing to the coarse and nuggety nature of the gold it may be possible to obtain by a good mechanical reduction process and amalgamation, such a percentage of recovery that only a small cyanide treatment plant may be necessary. With such facilities for working as exist, working costs should not exceed 17s. 6d. per ton. Taking the value of the gold recovered at 40s. per ton, which, in my opinion, is a conservative estimate, with the working costs as above mentioned (viz., 17s. 6d. per ton) the very handsome working profit of 22s. 6d. per ton is arrived at.

Equipment and Plant.—The proposition, judging from the nature and values of the reefs so far exposed by the work done, warrants an expenditure for equipment and development of at least £40,000. This would bring the mine to a dividend paying stage; when, by an arrangement in the flotation of a company for holding in reserve a certain number of shares, the plant could be increased in proportion to the increased development during the earlier period of working, and so a corresponding increase of profits would result. In conclusion, I have to state that the proposition is one which I can confidently recommend as a sound gold mining venture, which, if properly managed and not over-capitalised, will within a reasonable time show very profitable returns.

May Consolidated.

The secretary writes under date December 18: "I am directed to inform you that crushing was resumed at seven o'clock this morning."

E.R.P.M. Dividend Passed.

The following cablegram has been dispatched to the London office of the E.R.P.M.:—The available cash at 31st December, exclusive of the development suspense funds, viz., £355,000, is estimated at £83,500. In view, however, of the unsatisfactory value of reef which continue to be disclosed, the consequent considerable depletion of the ore reserves, the abnormal inflow of water met with in the crosscut, and the fact that next year the tonnage milled will clearly be less than for 1916, the board, in conformity with the policy set forth by the chairman at the annual meeting, has decided not to declare a dividend for the half-year, but to strengthen further the financial position having regard to the debenture debt and to the funds required when the reef is met with in the sub-vertical shaft."

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STATE COAL MINES AND THE S.A.R.

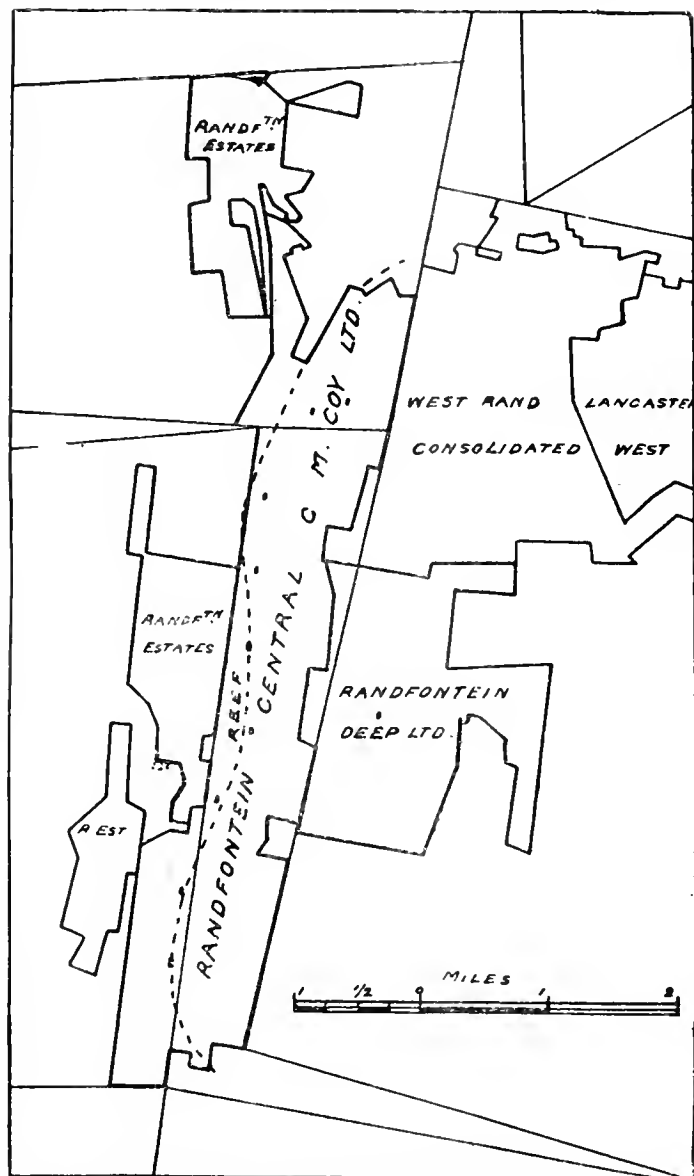
Sir William Hoy's Views.

In the course of his evidence before the State Mining Commission at Capetown, Sir William Hoy, general manager of the S.A.R., said:—I concur in the views already expressed by one of the witnesses before this Commission, that the question of State collieries is one of "efficiency" and "expediency." The South African Railways consume over 22 per cent. of the total output of the Union coal mines, their purchases of steam-coal during 1915 being as follows: Transvaal, 1,377,353 tons; Natal, 440,350 tons; Cape, 30,488 tons; Orange Free State, 15,199 tons; Rhodesia, 11,987 tons; or a total of 1,875,377. Coal being such an important factor in railway expenditure, it is imperative that it should be secured at the lowest possible price. The railway and Government coal requirements go a long way towards meeting the working costs of many of the existing mines, and a monopoly by Government coal mines of this supply might involve closing down a number of private mines. The railways should not pay more than the ruling market rate for coal mined by the State, and, to succeed, the State mines would have to be operated as efficiently as the private mines. So long as coal is available at a reasonable price for the railways and other industries, I see no reason for the inauguration of State collieries. The Administration owns certain coal-bearing areas, and at one time last year it seemed as though it might be necessary to open up a colliery as, in connection with the renewal of contracts, prices were demanded which were considered inequitable.

PROTECTION AGAINST PRICE INFLATION.

A State-controlled mine might afford protection against any undue inflation of prices on coal for local consumption (the price of bunker and export coal is governed by world competition). On the other hand, if the Government mine were not economically worked, this would strengthen the position of private collieries in increasing prices. Should the Administration's coal-bearing ground be opened up, as it no doubt will be in the near future, I would not advocate working the collieries departmentally. In my opinion they should be privately worked and the Administration, in consultation with the Mines Department, should arrange a price at which coal should be supplied to the railways, a royalty being received on coal sold to the public. In other respects, the mine should be worked and controlled as a private concern. In the State of Victoria a Government-owned coal mine is worked by the railways. During the year ended June 30, 1915, the output was 567,057 tons, the bulk of which was consumed by the railways. The mine returned a profit of £10,639 after allowing for interest, depreciation and sinking fund charges. I have no details as to the methods of operation or management. In India there are several State mines worked by the railway companies, but I cannot say with what measure of success. Some of the American railways have also an interest in certain coal mines.

THE RANDFONTEIN MINES.



SHOWING THE RANDFONTEIN CENTRAL AND RANDFONTEIN DEEP.

ANSWERS TO CORRESPONDENTS.

All inquiries addressed to the Editor must bear the writer's name and full address. We cannot reply to inquiries by letter, but telegrams with replies prepaid will be answered. Correspondents are requested to write their names and pseudonyms distinctly.

- "F. Levy."—Your letter is libellous.
- M. Offen & Co. (Luderitzbucht).—Your letter has been handed to the firm in question.
- "D. M." (Germiston).—Better write to the Secretary, Exploration Buildings.
- "L. C. H." (Durban).—Your request has been complied with.
- "A. B. C." (Capetown).—Better hold all.
- "M. A." (Selukwe).—All four should prove safe investments.
- "Harriskale" (Randfontein).—(1) Yes. (2) About January 3.
- "Curious."—The Secretary of the Company, News Stock Exchange Buildings, will send you all particulars if you write to him.

Mr. A. J. T. Crosby, of Johannesburg, has been appointed manager of the Moodies Gold Mining and Exploration Co., and has taken up his residence on the estate.

Diamond Companies' Meetings.

At the annual meeting of the S.A. Diamond Corporation, Ltd., held in Kimberley this week, it was reported that there was every prospect of continued prosperity in the diamond trade, consequent on the big producers' policy of limiting production. It was further stated that the company had secured farms in the Aliwal North district, and that on other farms in the district rich patches had been struck. The chairman stated that, while America had been the principal buyer of diamonds during the year, Russia, India and the Far East had been responsible for a large volume of trade.

At the annual meeting of the Blaauwbaasch Diamonds, Ltd., the chairman stated that the directors had decided to declare a dividend of 5s. per share.

RECENT DEVELOPMENTS NEAR LYDENBURG.*

[By C. HOWARD.]

Two hundred feet below the base of a lava sheet, which forms the cap of Mount Anderson, and beneath a succession of shales, quartzites and diabase, lies a flat reef, bedded between quartzite and an underlying series of shale beds. The plateau which surrounds the peak is cut into in every direction by ravines, on the sides of which the reef can easily be traced for considerable distances, and on a few hundred acres of Government ground which lie between the blocks of companies' farms it is being opened up by several diggers. On the adjacent farms it has also been found. In width it varies from 6 to 40 inches. In parts the overlying strata have been eroded and the ore could be obtained by stripping off a foot or two of soil. Where erosion has not occurred it could be mined by removing two feet of the underlying rock, leaving a solid quartzite roof to the stopes. The gold contents are variable, sometimes high. The trifling amount of development done shows likelihood of medium average grade and fair widths over considerable areas. Values of 15 dwts. over 36 inches are reported from one section, and from another several ounces over lesser widths. It is possible that the reef area covers many square miles, but it is not likely that investigation will be carried beyond the narrow limits of Government ground until the district is open to prospecting. Connected with this flat reef, and dipping nearly at right angles to it, are a number of almost vertical parallel veins striking about north 50 degrees East, and lying within a few feet of each other. In width these range from half an inch to 20 inches, and seem to show a tendency to widen as depth is attained. These reefs have no casing, but simply fill fissures in the shale, which is apparently unaltered by the contact. In some instances the gold contents are stated to have impregnated the adjoining shale for six inches or thereabouts. Prospecting operations have proved these reefs to go down to 150 feet; at which depth there is no sign of their downward limit having been reached, and it is assumed by the diggers that they will extend to the next large quartzite bed or to the next flat reef, about 400 feet below the top flat reef. Where they can be examined on the steep sides of the ravines they usually seem to die out within a few feet of this flat reef, but in three or four instances they can be seen terminating in it, just as the well-known leaders in the dolomite and sandstone formations at Ledouphine, Waterfall, Op de Berg and elsewhere terminate in a flat sheet of

quartz. The grade varies widely. One party crushing half a ton per day has been making a profit of £100 a week for a considerable time crushing specimen rock, and has now erected a 5-stamp mill to crush everything as it comes. Two more 5-stamp mills are almost ready to start, so that in a few months a guess at average grade will be possible. A remarkable feature of these vertical reefs is their occurrence in groups, sometimes a dozen lying within a few feet of each other, and traceable down one face of the hill and up another for several hundred yards. Similar occurrences, though in smaller groups, can be seen three or four miles down the Spekboom, some of which are being successfully worked. Since these verticals are terminated by the flat reef, it follows that they must be looked for below its level on the hill sides, which, unless very steep, are usually covered with loose soil and rock. The search for them consequently involves trenching along the sides of a hill which is known to carry the flat reef. It is not likely that they are confined to the two or three natural exposures on Mount Anderson and its vicinity. Their steepness renders the hill sides bare, preventing accumulation of soil and loose rocks, and the reefs are therefore visible. The laws which regulate the distribution of gold in these reefs are quite obscure. In one or two cases the rich shoots seem to occur in parallel levels, with intervening barren or poor spaces, but these instances are too few to found a theory on. It may be that the occurrence of gold will be found connected with the nature of the varying shales, through which the reefs pass, just as those occurrences, 50 miles north-east of Lydenburg, cutting through alternate beds of shale and dolomite carry most of their gold in passing through the former, so that the dolomitic zones are left intact and mining confined to the shale levels. Another point to investigate is their relation to the dyke system, the knowledge of which relation has been of great practical utility in the lower formations. The work now proceeding is limited to so small a section of the gold-bearing area that any general inferences are likely to be misleading. The natural facilities are good. The most urgent need of the diggers is a good road, which would enable Mount Anderson to be reached in an hour by motor car from Lydenburg, and would materially reduce working costs. The present road is needlessly circuitous, rough and dangerous.

*From the *Pretoria West Goldfields, Mines, and Claimholders' Quarterly*.

Mr. Wilson-Fox, in the course of a paper read last week before the Society of Arts, on the development of Imperial resources, advocated the inauguration after the war of a systematic development by the State for the State of the undeveloped resources of the Empire. He considered arrangements with the self-governing Dominions in this direction were quite feasible. Lord Selborne, who presided, complimented Mr. Fox on his series of pregnant suggestions.

Koffyfontein Mines.

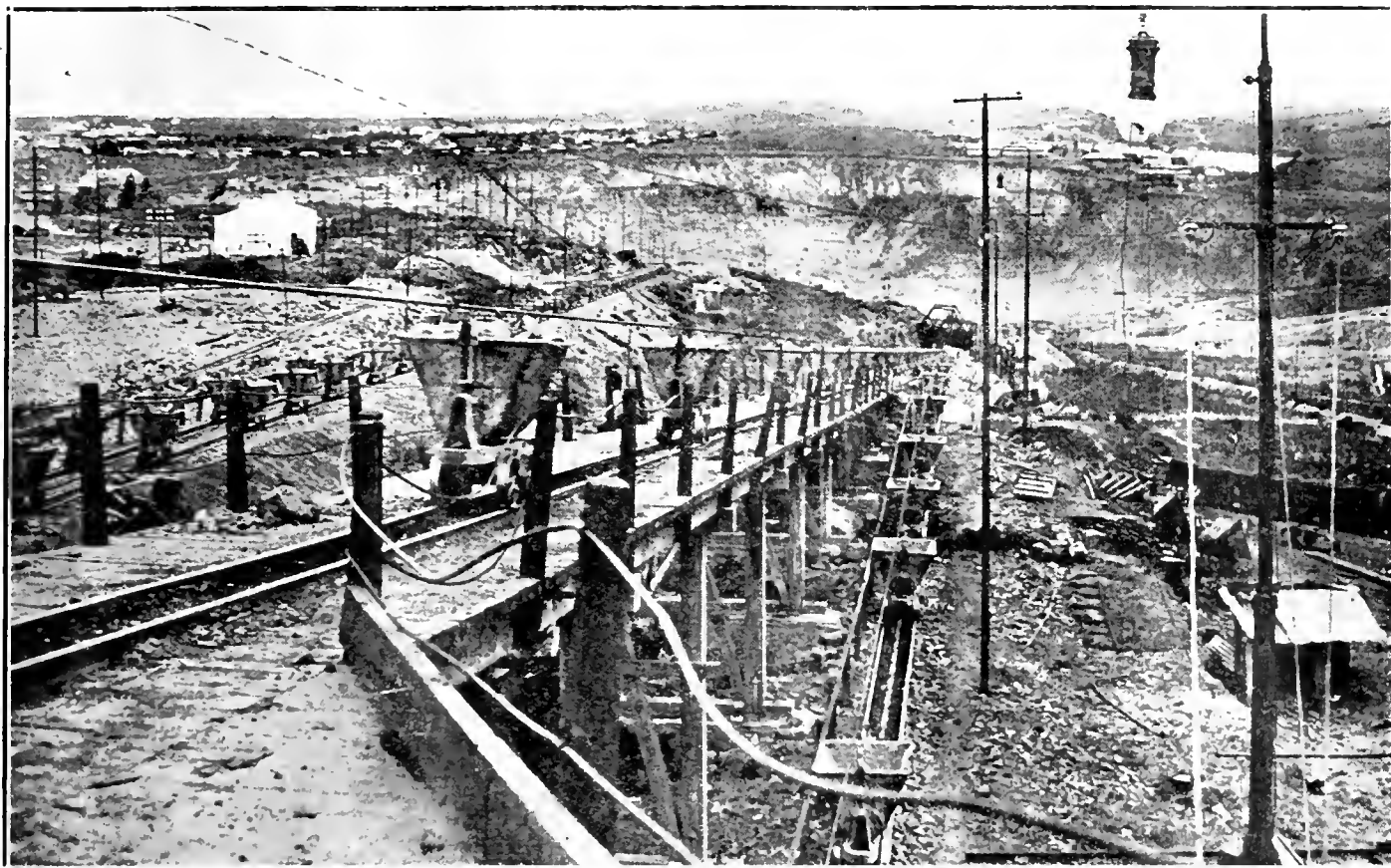
At the annual meeting of the Koffyfontein Mines, Ltd., the chairman, Mr. F. Hirschorn, moving the adoption of the directors' report and balance sheet for the year ending June 30, 1916, the chairman dealt exhaustively with the figures of the working for the year, which, owing to various causes, resulted in a loss of £23,759. The financial position of the company was, however, owing to the diamond production at the time not being fully realised, nor truly reflected by these figures. The chairman expressed the opinion that the company must inevitably participate in any prosperity resulting from a policy of restriction of output, in accordance with the demand, adopted by different producers. This was the first meeting of the company in South Africa since the transference of the company's head office from London to Koffyfontein.

Wollhuter.

The report for the quarter ended 31st October, 1916, shows that 120 stamps, four tube mills, and cyanide works milled 107,550 tons; total working costs, £92,181 11s. 5d., or 17s. 1705d. per ton milled; profit for quarter, £41,232 16s. 11d., or 7s. 8012d. per ton milled; revenue, £133,414 8s. 1d., or 24s. 9717d. per ton milled. No allowance has been made for the Government tax on profits. On the 17th October, 1916, dividend No. 18 of 7½ per cent. (1s. 6d. per share) was declared for the six months ending 31st October, 1916, payable to shareholders registered 31st October, 1916. The capital expenditure was as follows:—Shafts, £515 7s. 5d.; buildings, machinery and plant, etc., £399 3s. 7d.; total, £914 11s. Tons developed or exposed during the quarter: Estimated payable tonnage, 123,323 tons, assay value 6.2 dwts. over 57.6 in.; estimated unpayable tonnage, 32,970 tons, assay value 2.8 dwts. over 64.9 ins. The ore reserves are being re-calculated and will be shown in the annual report. The machinery and plant continue in good working order.

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PREMIER MINE IN FULL SWING AGAIN.



VIEW FROM HAULAGE INCLINE.

At the recent Tanganyika meeting in London, Mr. Robert Williams divided his speech into three parts—finance, copper, and railways. In connection with the first-named, he pointed out that, taking Union Minière shares at £10, the value of the Tanganyika holdings in other companies exceeds £7,000,000, in contrast with £3,467,854 in the balance sheet, showing a margin of about £3,650,000 above the issued capital and debenture debts, including accumulated interest on the debentures. The Belgian Government own about 35 per cent, and the Tanganyika Company about 40 per cent, of Union Minière shares, or about 75 per cent, between them; and Mr. Williams is endeavouring to bring about a division of profits now, such action to be ratified at the first general meeting of the Union Minière in Brussels. Owing to the high price of copper—the average for this year is £102—the furnace plant will be paid for out of profits. The new furnaces show a saving of about £5 per ton of copper at the works. The cost at the works this year has averaged £25 12s. per ton, and the total cost delivered in England has been £11 11s. 3d. This, it must be admitted, is a very creditable achievement. The large profits being earned are not due to the war; the Union Minière would have made £2,000,000 at this date if no war had been declared and with copper at normal prices. Mr. Wheeler's report on the treatment of low-grade ores is in the hands of the board, and is of a most important character. Difficulties can be overcome, and by leaching, too, copper can be produced from high-grade ore cheaper than by smelting, and the recommendation is made to install a plant capable of turning out 50,000 tons of electrolytic copper per annum. It is impossible to proceed more rapidly with the construction of the Benguela Railway, as if the material were procured from America the additional cost would be about £1,200,000. This, doubtless, is the reason that the Portuguese Government has modified the terms of the railway concession. An improvement is being shown by the Rhodesia-Katanga Junction Railway, and in this connection it is interesting to note that, labour conditions being satisfactory, copper production at Kansanshi will begin next spring.

The Tanganyika Company.

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The great war is causing some radical changes in British industries, which will be still more pronounced when the clash of arms is over and the industrial struggle that must inevitably supervene commences. Among the greatest of these changes will be the enfranchisement of Great Britain from the industrial servitude it endured at the hands of Germany and Austria as regards certain important branches of manufacture. The most prominent of these was perhaps the making of dyes and of certain classes of chemicals and electrical apparatus, and in respect of the former a strong and promising effort, as we know, is being made to render us independent in the future of German supplies. But there are also a number of minor, but yet quite important, branches of industry wherein the Germans, owing it must be confessed to their initiative and industry, have hitherto enjoyed a practical monopoly, and among these one of the most interesting and profitable was that of "de-tinning," or utilising what was regarded as waste tin for the purpose of re-manufacture. This de-tinning business was before the war solely in the hands of the Germans. Through their agents they bought the waste tins and other metals from the municipal authorities and others, crushed them by means of steam rollers and shipped them to Germany, where the tin or zinc, as the case may be, was extracted. The plates were then melted down and the steel was converted into light rails and many other articles, some of which came back to this country in the shape of bric-a-brac, toys, etc. The business must have been of a profitable nature, as the Germans not only bought this waste material in large quantities from Great Britain, but also from Canada, Australia, South Africa and other colonies. Here, palpably, was an opening, now that Germany can only depend upon her own and Austrian resources for such material, to establish an independent British industry, and it is in order to take advantage of this favourable opportunity that the British De-Tinning Company has been formed. This undertaking is a purely British concern and proposes to employ British labour only. As the work does not involve highly skilled labour, it is hoped to give employment to a large number of wounded soldiers who may be unfit for work of a technical or strenuous nature.

The British De-Tinning Co.

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STATE MINING: SOME CAPETOWN VIEWS.

GIVING evidence before the State Mining Commission last week, Sir Wm. Hoy entered into an elaborate analysis of State control of railways, and said all arguments in favour of State railways did not apply to other forms of State enterprise, but most of the objections did. In the case of coal and gold mining, Sir William reminded the Commission that the State could not recoup itself for increased working costs by increasing the price of commodities, because the price of gold was a fixed quantity, and the price of coal was determined by competition. A mine was a localised industry which could be worked successfully by a company with small capital compared with that of a railway. One important argument advanced against undue extension of State industrial activity was that a stage would ultimately be reached when Government employees would be able, through Parliament, to dictate the conditions of their employment. No doubt the common-sense of the community would in time restore matters to a proper level, but experience in the meantime might be disastrous, and have a far-reaching effect on the country's trade. Replying to questions, Sir W. Hoy said if the railways did not pay, the country was getting the benefit, and the loss was not so material, but if a mine that did not pay was opened up there was a dead loss.

Mr. A. F. Batty, representing the Cape Province of the Federation Cape Labour Unions, said his unions were in favour of State gold mining, principally because (1) of the effect of the output of gold on the prices of other commodities; (2) the conditions of the workers, and the effect on the general community; (3) the risk involved; and (4) general considerations. Mr. Batty referred to the serious mortality on the mines, and declared if the gold mines had been run by the State thousands of young men who were now in their graves would no doubt have been alive to-day, and been a rich asset to not only the country, but to the whole Empire. Proceeding, Mr. Batty said it was generally admitted that disputes were far less frequent when the workers were employed by the State. There was an ever-increasing driving force on the mines towards larger profits, which caused excessive speeding up, and a constant effort to reduce wages as low as the workers would stand, which led to perpetual industrial disputes, lowering of health, shortening the lives of the workers, and a bad general effect on the whole community. This applied particularly to the gold industry. All these bad effects could be largely avoided under State enterprise. He was of opinion that all mining should be in the hands of the State, so that all profits may be used to establish reproductive industries to take the place of the diminishing asset in mines.

New Patents:

- 295 Gogu Constantinesco and Walter Haddon.—Improvements in the storage and utilisation of energy by means of liquids.
- 296 Acetylene Illuminating Company, Ltd., and Arthur Stephenson.—Improvements in or relating to the storing of gases under pressure.
- 297 Alfred Henry Willett.—Improvements in arches and arch bricks.
- 298 George Russell Beith and British Agencies, Ltd.—Improvements in lamp locks.
- 299 Robert G. Mackie.—Self-closing glandless tap, for water or other liquids, air, or gas.
- 300 Frederick Victor William Swanton and William Albert Lambert Snea.—Improvements in temporary locking devices in door or gate, furniture and such like.
- 301 Frank Hill.—Improvements in non-rotating spindles for self-oiling rollers or pulleys.
- 302 Thomas Symes.—Improvements applicable to smelting and other furnaces.
- 303 Kenneth Bertram Lamont.—Improvements in connection with securing tube mill liner bars.
- 304 Kenneth Bertram Lamont.—Improvements in securing tube mill liner bars.
- 305 Edgar Rouse Sutcliffe.—Improvements relating to presses.
- 306 Edgar Rouse Sutcliffe.—Improvements relating to presses.
- 307 Marconi's Wireless Telegraph Co., Ltd., and Isaac Schoenberg.—Improvements in frequency multipliers.
- 308 Walter Edward Kimber.—Improved apparatus for atomizing liquids especially applicable for supplying water under pressure in a spray form for use with rock drills.
- 309 Marie Olive Cranston.—Improvements in reinforced concrete.
- 310 Thomas B. Joseph.—Metal leaching process.
- Montagu Harrison Wynyard.—Improvements in scutching machines.

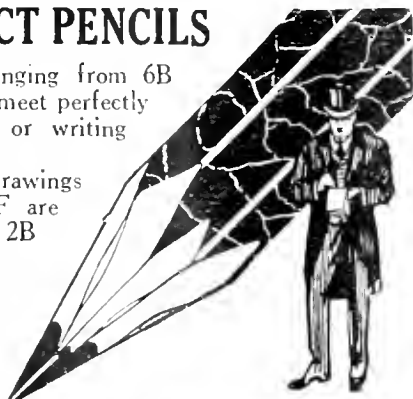
Southern Van Ryn Reef.

The secretary of the Southern Van Ryn Reef communicates the results of the No. 5 borehole. This borehole intersected the Nigel Reef in two sections. The upper reef at 581 to 585 feet. Top $4\frac{1}{2}$ inches assayed 3.4 dwts.; middle 2 $\frac{1}{4}$ inches assayed 27.2 dwts.; bottom $1\frac{1}{4}$ inches assayed 2.2 dwts. The middle portion was friable and part was ground away by the drill. The lower reef at 594 feet to 594 feet 3 inches, 3 inches reef assayed $1\frac{1}{2}$ dwts.

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THE YEAR WITH THE CONSOLIDATED GOLD FIELDS.—II.

Points from the Reports of the Directors, Manager and Superintending Engineer.

Mr. D. Christopherson, the Johannesburg manager of the Consolidated Gold Fields, writes as follows:—

Next to the decreased efficiency due to the absence of so many trained employees, one of the principal effects of the war has been the increase in the cost of stores and mining supplies. The full extent of this increase is not always correspondingly reflected in the working costs, owing, to a great extent, to the rigid economy in the use of stores which has been exercised and also to the fact that by buying in advance the companies have been able to save large sums of money, and in this latter connection acknowledgment is due to Mr. C. O. Wallace, our buyer, for the careful foresight which he has exercised in making the purchase of supplies for the companies. The following table shows, with regard to certain lines largely used by the mines, the prices ruling in July, 1916, as compared with those obtaining before the war, and also the average prices at which, owing to advance buying, our mines were able to charge out stores used during that month:—

Article.	Pre-war price.	Present price.	Difference in cost to Group per month on present price.	Average issue price on Group Mines in July, 1916.	Consumption per month.	Difference in issue price & present price showing saving to Group per month.
Cyanide	10½d. lb. bottle.	11½d. lb. bottle.	£ 513	1 1/1d. lb. bottle.	44 long tons.	—
Mercury	£8 10s.	£17 10s.	£ 117	£16 0s.	13 bottles.	—
Zinc	3½d. lb.	1s. lb.	£ 3,541	1 3/4d. lb.	50 short tons.	—
Candles	4½d. lb.	8½d. lb.	£ 2,050	6½d. lb.	115,816 lbs.	£ 941
Carbide	22s. % lbs.	45s. % lbs.	£ 1,012	26s. % lbs.	44 short tons.	£ 835
Shoes and dies	18s. % lbs.	31/6d. % lbs.	£ 1,024	25. 6d. % lbs.	151,850 lbs.	£ 455
Steel plates	15s. % lbs.	30/- % lbs.	£ 900	21 3/4d. % lbs.	60 short tons.	£ 525
Rails	£9 10s. ton.	£18 10s. ton.	£ 450	£15 10s. ton.	50 short tons.	£ 150
Drill steel	3½d. lb.	7d. lb.	£ 1,327	4½d. lb.	45½ short tons.	£ 1,042
Per month			£ 10,934			£ 3,949
Per year			£131,218			£47,388

The uncertainty of supply and shipping has necessitated large reserve stocks of supplies being carried by the mines of the Witwatersrand and a corresponding increase in the amount of money locked up in this connection. At 31st July, 1914, the value of stores and material held by the Witwatersrand mines was £700,000, as compared with £2,600,000 at 31st July, 1916, an increase of £1,900,000. The output of gold from the Witwatersrand gold mines during the year under review was 8,971,282 fine ounces from 28,754,982 tons of ore crushed, resulting in an estimated working profit of £11,860,000, as compared with 8,394,573 fine ounces, 27,283,176 tons of ore crushed and £11,820,000 profit, respectively, for the previous twelve months. The increase of 576,709 fine ounces of gold, value £2,449,704, is most gratifying, being equal to 6·87 per cent. There has been a slight decrease in the output by the mines outside the Witwatersrand areas. Taking the Transvaal as a whole, the ore milled showed an increase of 1,510,310 tons, of which the Gold Fields group of mines contributed 445,745 tons, equal to no less than 29½ per cent. thereof. The increase in gold production was 571,762 fine ounces, value £2,428,691, or 6·54 per cent., of which the mines of our group provided 117,810 fine ounces, or over 20 per cent. thereof. The average recovery value of the Witwatersrand gold mines for the twelve months ended 31st July, 1916, shows an increase of 3d. per ton as compared with the previous twelve months, being 26s. 1d. as against 25s. 10d. per ton crushed. The working costs for the same period were 17s. 10d. as against 17s. 2d. previously, or an increase of 8d. per ton. The working profit was therefore 8s. 3d. per ton, or a decrease of 5d. per ton. In view of the various disabilities which the mining industry has suffered in consequence of the war, the above results must be looked upon as very satisfactory. It must, however, again be recorded that the disabilities arising from war causes have been largely set off by the improvement in the native labour supply, which has enabled operations to be carried on on a larger scale by many companies, including most of those of our own group, and has also permitted the re-starting of the Jupiter Gold Mining Company in September, 1915, which company contributed 15·9 per cent. of the increased tonnage milled for the Witwatersrand. Taking the companies of our own group, the figures are as follows:—

FOR THE YEAR ENDED JULY 31.

	1915.	1916.	Increase.	Decrease.
Tons crushed	3,387,215	3,832,960	445,745	—
Fine ounces gold	806,264	924,074	117,810	—
Total working profit ..	££924,399	£879,020	—	£45,379
Revenue per ton milled ..	19/11·480d.	20. 1/128d.	0/1·648d.	—
Working costs	14/ 5·982d.	15. 6/088d.	1/0·106d.	—
Profit	5/ 5·498d.	4. 7/040d.	—	0. 10/458d.

The average working costs for our crushing mines on the Witwatersrand (excluding Sub Nigel) were 15s. 1·35d. per ton crushed, as compared with 17s. 10d. for the average of the whole of the mines on the Witwatersrand; or 18s. 3·012d. if we exclude our own companies and take the remaining gold mines. Owing to the increased cost of freight and insurance, the estimated realisable value of gold has been reduced by about 6½ per fine ounce—i.e., from 83s. 10d. to 83s. 4d. Had it not been for this reduction, the yield from gold would have been £22,442 more, thus representing a profit of 1·405d. per ton milled. Furthermore, the total cost of stores included in the working costs for the twelve months ended 31st July, 1915, was £845,376, whereas for last year the item was £1,103,049, and, after allowing for the greater tonnage dealt with, this is equal to an increase of 9·2d. per ton milled. This is despite the economies in the use of stores to which I have already referred. These two items alone total 10·605d., and consequently more than offset the decrease of 10·458d. in the profit per ton milled. The supply of native labour, as already stated, has been good for the past year. In February last a record was touched as to the total number of natives employed on the gold mines of the Witwatersrand—namely, 213,436. Recently there has been some reduction in this number, but those who should be in the best position to judge anticipate that the natives will now be coming forward again in such numbers as to fill all the requirements of the industry. For the year ended 31st July, 1916, the Native Recruiting Corporation recruited 17,366,351 shifts at a cost of 5·2d. per shift, as compared with the previous year 16,370,065 shifts at a cost of 5·7d. per shift. This shows a reduction of one halfpenny per shift in the cost of recruiting. The average number of natives employed on the Witwatersrand gold mines during the twelve months ended 31st July, 1916, was 205,374, as compared with 178,729 for the corresponding period, or an increase of 26,645, equal to nearly 15 per cent. It is interesting to note that since August, 1908, the native labour force on the gold mines of the Rand has increased by approximately 50 per cent. The following are comparative figures in respect of the underground labour force of the gold mines who are members of the Native Recruiting Corporation:—

Average for year ended.	Complement (i.e., number of natives required).	Average natives employed.	Percentage of complement.
31st July, 1914	151,452	98,496	65·03
31st July, 1915	152,467	116,926	76·69
31st July, 1916	151,437	111,217	93·30

At the end of October, 1915, January and February, 1916, the percentages of underground natives employed to the underground complement were 99·29, 99·39, and 99·40, respectively, while at times during February, 1916, it was actually over 100 per cent. Moreover, many individual companies had over 100 per cent. For our own group of mines the corresponding figures of complements for the same periods have been 55·37 per cent., 74·94 per cent., and 91·89 per cent, respectively, while for seven months during the year the average was nearly 95½ per cent. The death rates from accident and disease among natives have steadily reduced of late years. For instance:—

For the year ended 31st July.	Diseases per 1,000 per annum.	Accident per 1,000 per annum.
1913	25·03	4·70
1914	16·09	3·85
1915	14·99	3·58
1916	15·55	3·20

In connection with the reduction in the accidents death rate, a good deal of credit is undoubtedly due to the efforts of the Rand Mutual Assurance Company, Ltd., by whom the "Safety First" movement was inaugurated in November, 1913, in connection with which a strong Prevention of Accidents Committee was formed, which has done excellent work. The new Miners' Phthisis Law, which was passed at the last session of the Union Parliament, and which came into operation on the 1st August of this year, is undoubtedly a great improvement on previous legislation. It is the opinion of Dr. A. H. Watt, the chief medical officer of this group, that the new law, if well administered, offers a better opportunity than that given under any previous legislation for reducing this disease on these fields to a minimum. One of the most important provisions of the new Act is that after the 1st August, 1916, the compensation payable will be the same to all appli-

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cants, no matter whether they have the disease in the early stage or in the last stage. Under the previous Act, an applicant in the first stage could receive a maximum of £200 and in the last stage £400. By making the compensation the same all round, it is hoped that in future the sufferers will give up mining before the disease reaches an advanced stage, thus benefiting themselves and the whole community. With a view to eliminating tuberculosis from the mines, the new Act provides that all underground employees have to be medically examined every six months, and no one found suffering from tuberculosis will be allowed to continue to work underground. Any such worker will, up to August, 1917, be compensated up to £300. In addition to this the Act compels fresh applicants for work underground to submit themselves for medical examination, and if they have any disease of the lungs or respiratory organs they will not receive the requisite medical certificate which is now necessary before any man is allowed to work underground. The new Act further provides for extra compensation to men who have already received compensation under the old Acts. No reliable estimate can be formed as to how much the new law will increase the existing burdens of the industry in this connection, but it may be that a considerable amount will be involved. On the other hand, it remains to be seen whether, with efficient administration of the Act, the extra cost will be as great as was anticipated. It might be mentioned that since the 1st August, 1912, the total assessment on the industry in connection with miners' phthisis (excluding Government and employees' contributions) to the 31st July, 1916, totalled £1,904,951—equal to 4.15d. per ton crushed. In addition to this, the industry has spent large sums on dust allaying and improving ventilation, and in respect of the Miners' Phthisis Sanatorium. In this latter connection our group has spent during the same period of four years £140,257, which is equivalent to 2.33d. per ton milled. This expenditure has been fully justified by the resultant improved condition underground. The thanks of the industry are due to the Miners' Phthisis Prevention Committee, which body, under the chairman of Mr. R. N. Kotzé, the Government Mining Engineer, has continued to carry on excellent work. Various other measures have been taken by the mines to improve the health conditions of their employees. A comprehensive scheme of leave privileges for mine employees other than officials was brought into operation by the Chamber of Mines on the initiative of Mr. C. D. Leslie, your superintending engineer, as from 1st December last, and, in our own group, we have instituted physical culture classes free of cost to underground men. The Special War Tax (Gold Mines) Act, 1916, re-enacts the special war levy of £500,000 on the gold mines for the Government's financial year ending 31st March, 1917. The extra cost of production, owing to the war, to the whole industry (including this special war levy) is now approximately £3,000,000 per annum, which in itself is sufficient to refute the argument that the gold mines have suffered less on account of the war than the rest of the country, and that consequently they should find a greater proportion of the extra revenue required. There is no justifiable reason why the gold mines should be singled out for more taxation than the rest of the country, more especially when it is remembered of what great value the working of the mines during the war has been to the general prosperity of South Africa. During the past year interest has been largely centred in the Far East Rand area of the Witwatersrand. Reference to the published reports of the individual companies operating in this district will show that during the year the development has opened up large tonnages of valuable ore, whilst the crushing companies in that area continue to show increased profits. The superintending engineer's report deals with Government Gold Mining Areas (Modderfontein) Consolidated, Ltd., in which you obtained an interest during the past year. It also deals with the prospects of the farm Grootfontein (in which the Consolidated Gold Fields holds an 86 per cent. interest) in the light of more recent development in areas adjoining that farm. In February last the Government Mining Engineer submitted a memorandum to the Government regarding the great possibilities and potentialities of these areas, and at the same time advocated certain alterations and modifications of the existing law under which the Government deals with this ground. During the last session of Parliament a Select Committee was appointed to consider and report upon the present position in regard to the development of these areas and what steps should be taken in the true interest of the country to open up same. The Select Committee presented its report embodying a draft Bill, the passing of which, it was considered, would facilitate more rapid development. The Bill was

introduced in the House of Assembly, but, unfortunately, was not proceeded with. In the meanwhile the Government, evidently recognising the urgent desirability of more ground being opened up and profits made therefrom to replace the profits from mines where the life is now very short, has called for applications for the leases of two areas of 651 and 1,812 claims respectively. During the year the interests of the Robinson Deep Gold Mining Company, Ltd., Booyens Estate, Ltd., South Deeps, Ltd., and of the owners of Booyens Freehold were amalgamated on the lines stated in my last report. In the light of subsequent events, shareholders of the Robinson Deep who may have had doubt as to such an amalgamation being to their interests will probably feel more satisfied that the amalgamation has proved a factor in securing to them possibly more profits than might have been the case had the Robinson Deep continued to work its own life out. In spite of heavy expenditure, amounting to an average of over £3,000 per month, in trying to maintain No. 2 vertical shaft, the ground pressure has continued so great that preparations are now being made at large expense to abandon this vertical shaft. It is hoped by this expenditure to be able to deal with a monthly tonnage of 55,000 through No. 1 vertical shaft, until the new shaft being sunk on Booyens ground can be made use of. It is satisfactory to note that reports from the mine to date show that the values of payable ore exposed by development so far carried out in Booyens ground are up to the average of the existing ore reserves of the Robinson Deep Company. The recent development on the Sub Nigel, Ltd., has been of an encouraging nature, in that the payable chutes on the lower levels appear to be of greater lateral extent, whilst the width of reef also appears to be increasing, and values are more than maintained. In view of these disclosures the directors of the company opened negotiations to purchase 383,826 claims, situated on the dip of the Sub Nigel, and were successful in obtaining them for 43,420 shares, which is the number of shares the Sub Nigel had in reserve. The acquisition of these claims at the present time was very desirable in view of development work during the next year or so reaching their neighbourhood and of the good payable chutes which appear to trend in their direction. The results obtained by the Simmer and Jack Proprietary Mines, Ltd., for the last few months have been disappointing, but our engineers advise that from now on there should be a material improvement. The development in the Simmer Deep, Ltd., for some time past has been more encouraging, and considerable areas of payable ground have now been opened up. Here also it is hoped that improved profits will be maintained from now on, but, as in the case of Knights Deep and other low grade mines, profits are largely dependent on the amount of native labour available. In conclusion, gentlemen, I wish to record my appreciation of the valuable assistance and co-operation of the superintending engineer and the whole of the engineering staff, and also of the heads and staff of the other departments of this office. Owing to so many of the staff being away on active service, additional supervision and work has been thrown on their shoulders, and this has been willingly given by all, thus enabling the work of the office to run with a smoothness and efficiency which under the present circumstances would otherwise not have been possible.

(To be continued.)

Application has been made by Mr. F. C. Dumat, of Johannesburg, solicitor, acting on behalf of—The Witbank Colliery, Ltd., owner of the farms Witbank No. 141, Uitspan No. 555, Joubertsrust No. 551, and owner of mineral rights of portion of Blesboklaagte No. 311; the Middelburg Steam, Coal, and Coke Company, Ltd., lessees of two portions of Blesboklaagte No. 311; the Coronation Colliery, Ltd., lessees of three portions of Blesboklaagte No. 311; the Tavistock Coal and Coke Company, Ltd., lessees of portions of Blesboklaagte No. 311 and Kromdraai No. 432; all being joint-stock companies incorporated with the limited liability in carrying on business in the district of Middelburg, in the Province of the Transvaal, for permission to divert and use some of the water of the public stream, the Great Olifants River, principally for tertiary purposes also for primary and secondary purposes.

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THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

An Excellent Business Year—The Western Rand Brighter Prospects—Quiet Speculation in Copper Goods—Confidence and Quiet Buoyancy for New Year.

On the authority of a responsible man it is stated that the mining material merchants have had an excellent year for business, in fact the best for some years past, even including a part of the pre-war period. To put the explanation in a nutshell, the mines have purchased, in the twelve months, supplies for eighteen months, of all kinds of stores, machinery spares, drills, high-class steel, oils and everything both consumable and non-consumable to keep the mines running at full speed. The report of the peace proposals did not influence values, as private cables as well as those in the newspapers forecasted the result to a nicety. Another outstanding feature was the talk in reference to the semi-official knowledge as to the Johannesburg Consolidated group taking a hand in the Randfontein properties. The presumption is practically confirmed by the rise in Randfonteins from about 13s. to 17s. Naturally, increased activity on the Western Rand means a bigger demand for mining material, which news has come as a little surprise to the mining material community. An impetus is sadly needed in the Western Rand to bring it into line with the Reef generally; may the best of luck wait on the new brooms.

COMMERCIAL EXCHANGE.

Business has been very quiet during the week, and nothing much is expected during the forthcoming holidays. One noticeable feature, however, was the demand for copper wire and anything in which copper enters into the manufacture of electrical and commercial materials. Naturally the subject of next quarter's trading often comes under review, being all the more interesting and instructive because another year is being entered upon. The general opinion is that we shall go along much as usual, for although there may be difficulties in obtaining goods from Britain, owing to shipping obstacles, yet we are fortunately situated, as so many other sources are open to us and these all seem very keen and anxious to secure a footing in the South African mining market.

JAPAN, AMERICA, AUSTRALIA AND NEW ZEALAND.

Taking New Zealand first, it is recognised that nearly all the hempen ropes now used on these fields come from that country. But the chief feature at the moment is the importance the Japanese merchants are attaching to this place, as by the last few mails—in fact by every mail—circulars and letters are pretty well scattered broadcast in the Johannesburg offices. The leading lines at present being electrical appliances and electric light copper wiring; then comes a lot of manufactured goods, and the variety is gradually increasing; and as the prices are right, Japan can be reckoned on as no mean source for reliance. One special feature in these communications is the enquiry for maize, and although none has yet been exported, there seems a great probability of Japan becoming a market for our farmers and so assist in providing return cargoes; also other produce is enquired about, therefore it is satisfactory to notice that it is not altogether a one-sided affair. Australia now and again enquires about our maize in return for their ever-expanding imports into South Africa. The American importers also keep up constant communication both by cable and mail matter, their main imports being motor spirits for our ever-expanding motor industry, as well as lubricating oils of every description. Then their steel and iron imports have made great strides since the big war commenced, so altogether we are very fortunately situated for our outside supplies. Were it different, the intimation that the British Government would control the shipping until the end of the war would have created a very different feeling in South Africa than it does to-day. Although in certain quarters dealers in British specialities are much con-

cerned as to the future, yet the general tone is one of confidence and even quiet buoyancy throughout the mining material circles in Johannesburg, based on the fact that we have suffered so little in the past and shall rub along much in the old way in the immediate future.

TRANSVAAL AND NATAL COAL FIELDS.

The ever-increasing demand from the coal fields in the Transvaal, Natal and O.F.S. is thoroughly recognised as an important addition for the trade of Johannesburg. Under normal conditions, mining supplies should reach them direct from the coast, but that source is hampered, therefore this centre is more freely drawn upon month by month. Rails and trucks, more particularly the latter, are always wanted, so much so that a lot of new work finds its way into the Johannesburg yards. The Johannesburg foundries also have much new work from this source, mostly in the shape of fixing up broken and worn parts. It is anticipated that an important market in this direction may be opened up in connection with the motor car industry, in converting cars, by placing Johannesburg-made bodies on the motive power machinery, as well as the new commercial wagons for local transport in connection with some of the coal mines, favourably situated for road distribution.

SECOND-HAND MATERIAL.

Building materials and all kinds of oddments in the shape of old iron tubing and disintegrated batteries and machinery from derelict mines, as well as roofing iron, fencing material and so forth, have accumulated. The fact is that the accumulation of late has been due to slackness in the demand, as business in all the second-hand yards has been exceptionally slow this month. As regards the building material portion, that may have been adversely affected by the great Paardekraal gathering of the farming community, as well as their activity in ploughing and planting since the rains set in. However, much is hoped for on the turn of the year. Current rates are: Roofing iron, 7½d. to 8d.; deals, 9d. to 10d.; flooring, 4½d.; ceiling, 2½d.; scantling, 2½d.; fencing timbers, 1s. 9d. for 6 ft. lengths.

ELECTRICAL GOODS.

Business is nothing like what it was at Christmas time last year, as people are not spending money like they did, is the report of an old established firm in the electrical line. It appears that there are not so many private residences

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nearing completion as compared with the corresponding period, and the property owners are putting off repairs and replenishing electrical work until the last moment. British goods are coming forward very slowly, but for lamps and other small things required for house lighting there are ample stocks in town, although keyholders and tubing have recently risen, as the assortment of keyholders is being gradually absorbed without adequate replenishment from overseas. The feature of the electrical position is the demand for copper wire and everything connected with copper, and not a little quiet speculation is going on in consequence. There is a shortage of small motors, especially second-hand ones, for outside propositions, including Rhodesia. In fact all kinds of second-hand electrical power plant is scarce, and the assortment is nothing like what it was twelve months ago.

LOCAL MANUFACTORIES.

The foundries and engineering shops are well employed, but the rush has quieted down for the holidays. The representative of one engineering firm sadly complains of the losses occasioned by so many useless patterns being hung up. The reason is that it often occurs that a pattern is made for only one piece of machinery to replace a broken part. This pattern often costs more than is charged for the actual casting, or to put it mildly, there is no profit on the job. The explanation vouchsafed is, the severe competition in small work and the absence of cohesion in the trade. There is always a demand for wood-working machinery as well as for metal manipulation, as experts who cannot easily get work improvise a workshop in a back yard and start a wood turning or metal working shop, and so forth, and with the assistance of an electrical motor driven from the town's main, some very good and clever work is executed.

REVISED PRICE LIST.

Approximate war prices, subject to quick change.—Mining and building hardware: Iron, imported, round up to 1 in., 30s.; 2 in. to 6 in., 25s. per 100 lbs. Ditto, square, up to 1 in., 27s. 6d.; 1½ in. to 2½ in., 23s. 6d.; 2½ in. to 5 in., 25s. Flats, 3-16 in., 37s. 6d.; all from ¼ in. up, 30s. Angles, ½ in. to 3-16 in., 40s.; ¼ in., 35s.; 5-16 in. to ¾ in., 30s., excepting 5 x 4 x ¾ in.; mild steel bar, 4½ d. lb.; drill, 7 lb.; steel plates, 10ft. by 4ft. by 1-16th in., 35s.; ¾ in., by 3-16 in., 32s. 6d.; ¾ in. to 5-16th in., 31s.; ¾ in., up to 30s.; 10ft. by 5ft. by 1-16 in., 36s. 6d.; ¾ in. and 3-16 in., 34s.; ¾ in. to 5-16 in., 32s. 6d.; ¾ in., up to 31s. 6d.; intermediate sizes up to 12ft. by 6ft. by 1-16 in., 37s.; ¾ in. and 3-16 in., 34s. 6d.; ¾ in. and 5-16 in., 33s.; ¾ in. and up 32s., all at per 100lb.; hexagon and cuphead bolts, ½ in. diameter to 2½ in., 55s., over 2½ in., 52s. 6d.; ¾ in. to 2½ in., 50s., over 47s. 6d.; ¾ in., ¾ in., 1 in., up to 2½ in., 45s., over, 42s. 6d.; nuts, ¾ in., 10d. lb., ½ in., 60s., ¾ in., 57s. 6d., 1½ in., 1¾ in., 62s. 6d., 2 in., up, 67s. 6d.; washers, all sizes, 45s.; rivets, 3-16 in., 1s. 1d. lb., ¾ in., 5-16 in., 10½ d., 7-16 in., ¾ in., 7½ d., ½ in., 45s., ¾ in., 42s. 6d., ¾ in. up, 40s. lb.; shoes and dies, 32s. 6d. to 35s. per 100lb.; rails, £23 per ton; picks, 4lbs., 27s. per doz.; shovels, 32s. 6d. to 50s. per dozen; drill hammers, 5½ d. lb. to 6d. lb.; hammer handles (best American), 14 in., 3s. 6d., 24 in., 7s., 30 in., 9s. 6d., 36 in., 13s., per dozen; metal, anti-friction, 1s. per lb.; galvanised iron, 24 gauge, 6 ft. to 10 ft., 10½ d., 11 ft. 11d., 12 ft. 1s.; 26 gauge, 6 ft. to 8 ft., 8½ d.; 9 ft. and 10 ft., 9d.; flat galvanised, 18 to 24 gauge, 35s.

to 39s.; 26 gauge, 36s. 6d. 100 lbs.; floor brads, 36s.; ceiling, 40s.; wire nails, 37s. 6d. to 55s. per 100 lbs.; solder, 50 per cent., 1s. 3d. per lb.; locks, rim, 48s.; mortice, 60s. dozen; barbed wire, 26s. to 30s. 100 lb. coil.

Timber: Deals, Baltic, 9 x 3, short and medium, 1s. 1d.; longer lengths, 1s. 2d. to 1s. 3d. (Oregon, 1s. 1½ d.); flooring, 4½ x ¾ and 6 x ¾, 6½ d. to 6¾ d. per sq. ft.; do., 1½ x 1½, 9d.; and 6 x 1½, 9d.; ceilings, 6 x ½, 3¼ d. to 3½ d. per sq. ft.; Oregon, 4 x ½, 4½ d.; pitch pine, 8s. per cub. ft.; Oregon, 5s. 9d. to 6s. per cub. ft.; clear pine, ½ in. x 12 in., 7½ d. per ft.; 1 in. x 12 in., 8½ d.; teak, small planks, 14s. 9d. per cub. ft.; do., large, 15s. 6d.; jarrah, 9s. 6d. per cub. ft.; poplar, 1 in. x 12 in., 10d.; scantling, 1s. 1d. to 1s. 2d. per ft., 3 x 9.

Bricks, cement, lime, etc.: Cement, nominal, 34s. 6d. per cask; Pretoria Portland, 9s. 3d. per bag; 8s. 3d., truck loads; lime, white, 7s. 9d.; truck loads, 6s. 9d.; slaked, do., 5s.; blue, 3s. 3d.; plaster lime, 4s.; bricks, stock, delivered, 37s. 6d. to 45s.; wire cuts, 50s. to 70s. pressed, 70s. to 80s. per 1,000, road transport difficult to obtain; salt and white glazed bricks, £27 10s. per 1,000; tiles, roofing, £17½ square; glazed tiles, 10s. 6d. to 17s. 6d. yard; paving cement tiles, 8s. 6d. yard laid; terra cotta tiles, £15 per 1,000; reinforced concrete columns, 6 ft. plain, 22s. 6d., fluted, 2ts.; fireclay bricks, £9½, good average, per 1,000; clay chimney pots, 80s. per doz.; fire clay, 37s. 6d. ton on rail.

Oils, paints, lead, oxides, glass: Linseed, raw 30s.; boiled, 30s. per 5 galls.; white lead, 70s. to 72s. 6d. 100 lbs.; turpentine, 49s. 2/4 galls.; 10 1, 54s.; coal tar, imported, 10s. to 12s. 6d. per 5 galls.; oxide in oil, 36s. per 100 lbs.; dry oxide, 21s. to 22s. 6d.; S.A. crude oxide, 12s. 6d.; linseed oil putty, 4s. 6d. per 12½ lbs.; bladders, 36s. casks of 100lbs.; grease A.F. axle, 23s. 6d. to 25s. per 100 lbs.; tallow, 1s. per lb.; White Rose paraffin, 17s. 5d. 2/5; Laurel do., 17s.; petrol, 27s. 6d. 2/4; motor oil, 6s. to 7s. 9d. per gall.; engine lubricating oils, 23s. to 36s. 6d. per case; cylinder, 25s. to 40s.; paints in tins, 10d. to 1s. per lb., according to quantity, and if ordered to be mixed, 20 per cent. on pre-war rates. British plate-glass, ¼ in., 3s. 6d.; do., mirror, 4s. 6d.; window, 16oz., 1s. to 1s. 3d. foot.

Chemicals: Mercury, £20 per 75 lb. bottle; bichromate potash, 3s. 6d. lb.; chlorate, 2s. 6d. lb.; permanganate, 7s. 6d. lb.; alum, 4d. lb.; carbolic acid, 6s. 6d. lb.; borax, 87s. 6d. 100 lbs.; cyanide soda, 1s. 5d. lb.; hypo, 9d. lb.; acetate lead, 70s. 100 lbs.; litharge (assay), 70s. (commercial), 55s. 100 lbs.; zinc sheets and blocks, 1s. 6d. lb.; plumbago crucibles, 5d. per number.

Electrical Goods: Lamps, high volts., British, Holland & American, 16s. to 21s. wholesale, and 21s. to 27s. dozen, retail; carbon lamps, 7s. 6d. per dozen; pure rubber flex, 5d. to 6d. per yard; 3/20 coils of wire, 25s.; do., 3/22, 21s. 6d.; tubing, 13s. to 14s. 100 ft.; keyholders, 1s. 6d. to 5s. each; round blocks, 3½ in., 3s. 6d. doz.; lamp holder cord grips, 13s. 6d. to 14s. 6d. doz.; switches, 5 amp., 13s. to 14s. doz.; British glass shades, 21s. to 36s. doz.; Bohemian shades finished; porcelain shackles, 14s. 6d. doz.; do., bobbins, 9s. 6d. to 10s. per 100; cleats, 18s. per 100; P.O. insulators, 18s. motors, 3 h.p., about £30 to £35, new.

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THE WEEK IN THE SHAREMARKET.

Improving Tone and Tendency—Activity in Randfonteins and Randfontein Deeps.

The market steadied on Friday afternoon and the slump in Springs and Government Areas was arrested. The Stock Exchange was, of course, closed on Saturday. On Monday morning prices were generally maintained at last closing level, with the exception of Brakpans, for which no buyers were forthcoming and sellers only ex London at reduced rates. Business during the day was dull and restricted. Tuesday morning showed prices firm and generally unchanged, the only real activity being in Springs Mines and Randfonteins, both at improved rates, especially the latter. There was also a better disposition in Brakpans. The public seem to have been so much carried away in the pursuit of the fashionable stocks that they have overlooked Rand Selections, which on figures are at present standing well below their intrinsic value. During the afternoon there was a further advance in Springs Mines, and Geduld Props were also better. The opening business on Wednesday was mainly confined to dealings in Randfonteins, considerable numbers of which changed hands at enhanced rates. The advance was fully maintained at the call. Randfontein Deeps, which have been engaging attention during the last few days also moved up in sympathy. General business was even more restricted than it has been of late, and the turn over was very small, only nine stocks being dealt in, with no improvement over closing prices, except that already mentioned and an increased offer for Wit. Deeps. The two Randfonteins kept up their progress throughout the day and in the afternoon there was a decided firming up of the whole market, notably in Springs and Government Areas. The overnight advances were maintained on Thursday morning, Randfonteins making further substantial gains. At the call, when the turn came of Randfontein Deeps, there was quite an old fashioned Sally rush of members forming a pack, but the net result scarcely came up to expectations after all the fuss and noise. Outside stocks have been neglected during the week, the main dealings having taken place in South Van Ryns, for which there are buyers at 6s. 9d.; antimonies were sold at 3s. 6d., and Henderson's at 1s. New Farms are buyers at 1s. 6d.; Arachaps at 7s. 6d., with sellers at 10s., and Alkalis are on offer at 20s.

After the call on Thursday, up to the time of closing the market was engrossed with Randfonteins and Randfontein Deeps. By the way the two stocks fluctuated there must have been considerable in and out jobbing. The former, after making 18s., fell to 17s. 3d., and the latter dropped from 7s. 11d. to 7s. 3d. The recovery, however, was fairly prompt, and the parent stock closed at 18s. 1½d., with the Deeps at 8s. 3d. On Friday morning there was less activity. African Farms were in better demand at 8s. sales and buyers. Brakpans made 97s.; Mines Selections 21s. 9d.; Gedulds 43s.; Government Areas 50s. 3d.; Modder Bs £7 1s. 6d.; Kleinfonteins 23s.; Randfontein Deeps 8s. 1d.; Randfontein Estate 17s. 9d.; Springs Mines 60s. 3d.; Van Ryn Deeps 69s. The remaining stocks were unchanged at last quotations. Someone seems to have taken a fancy to Knight Centrals, for all the shares obtainable at 8s. 6d. were taken. The Stock Exchange closes from Saturday till Wednesday.

	Thurs., 14th.	Fri., 15th.	Mon., 18th.	Tues., 19th.	Wed., 20th.	Thurs., 21st.
African Farms	7 6*	7 6*	7 1*	7 6*	7 6*	7 6*
Apex Mines	6 6*	6 6*	6 9†	6 3*	6 3*	6 3*
Bantjes Cons.	11 0	10 10*	11 1*	11 4	11 3*	11 3
Blauwboosch Diamonds	—	—	—	—	75 0*	—
Brakpan Mines	97 9	97 9	96 6†	96 0†	95 0*	95 0*

*Buyers. †Sellers. A Odd lots. B Ex London.

	Thurs., 14th.	Fri., 15th.	Mon., 18th.	Tues., 19th.	Wed., 20th.	Thurs., 21st.
Breyten Collieries	—	—	—	18 0†	—	17 6†
Brick and Potteries	—	5 0*	5 0*	5 0*	—	5 0*
British South Africa	13 0†	—	—	12 6†	—	12 6†
Cinderella Cons.	6 0†	6 0†	5 6	5 6*	—	6 0†
City and Suburbans	37 0*	37 6	37 0*	37 0*	37 0*	37 6
City Deeps	—	85 0†	83 0*	83 0*	83 0*	85 0†
Cloverfield Mines	8 7*	8 9	8 6	8 6*	8 6*	8 6*
Clydesdale Collieries	12 9*	12 6*	—	12 6*	12 6*	12 9*
Concrete Construction	2 0†	—	1 6*	1 9*	2 0†	1 9*
Cons. Investment	18 6†	18 6*	—	—	—	18 3*
Cons. Langlaagtes	—	29 0†	28 0*	—	29 0†	—
Cons. Main Reefs	18 6*	18 11	18 0	18 6	18 6*	18 6*
Cons. Mines Selection	21 6†	21 0	21 0	21 0	21 3	21 3*
Coronation Collieries	32 6*	32 6*	—	30 0*	—	32 6*
Coronation Freeholds	—	0 6†	—	—	—	—
Crown Diamonds	3 0	2 0*	—	—	3 0†	2 0*
East Rand Centrals	9 6*	9 9	9 6*	9 6*	—	9 6*
East Rand Coals	2 6†	—	—	2 3	2 0*	2 2
East Rand Deeps	1 2*	1 1	1 2	1 2	1 2*	—
East Rand Mining Estates	—	15 6†	—	—	15 0†	16 0†
East Rand Props.	—	12 0*	—	—	—	11 6*
Eastern Gold Mines	1 0*	1 3*	—	1 6†	—	1 6†
Ferreira Deeps	30 0†	27 6†	—	27 6†	27 6†	27 6†
Frank Smith Diamonds	3 4*	3 4*	3 5	3 5*	3 5*	3 7*
Geduld Props.	40 3*	40 3*	40 0	40 6*	42 0	42 0*
Glencairns	1 0*	—	—	1 0*	—	—
Glencoe Collieries	10 6*	10 6	11 0†	10 0*	10 0*	10 3*
Glyn's Lydenburgs	—	—	15 0†	—	—	15 0†
Government Areas	50 0*	49 9	50 0	49 9*	49 6	50 6
Jupiters	7 9†	7 3*	7 6*	7 6*	7 10*	8 0†
Knight Centrals	8 6*	8 6	8 3	8 2*	8 2*	8 6
Knight Deeps	—	25 0†	—	—	21 6*	—
Lace Props.	5 0*	5 0	5 1	5 3*	5 4*	5 11
Luipaardsvlei Estates	7 6*	—	—	7 6	—	—
Lydenburg Farms	6 6*	6 6	—	6 3*	6 0*	6 9†
Main Reef Wests	3 4*	3 4*	3 5*	3 5*	3 6*	3 8*
Meyer and Charltons	112 0*	115 0†	—	—	—	—
Middelvlei Estates	1 2*	1 3*	1 4	1 3*	1 3	1 3*
Modderfontein B.	145 0*	144 6	143 6	144 0	144 0	145 0†
Modder Deep Levels	142 6*	141 0	140 6*	141 0*	141 0*	141 0*
Leeuwpoort Tins	13 0*	13 0*	12 6*	13 6†	13 6†	12 6†
Natal Navigation Colls.	20 0*	20 0*	20 0*	20 0*	20 0*	20 0*
New Boksburgs	1 6*	1 8†	1 8†	1 6*	1 6*	1 3*
New Eland Diamonds	19 0†	19 0†	19 0†	19 0†	19 0†	19 0†
New Eras	9 6*	9 6*	9 6*	9 9*	9 9*	9 9*
New Geduld Deeps	5 7*	5 6	5 8	5 8	5 9*	5 0*
New Gochs	—	—	10 0†	—	—	—
New Heriots	—	44 6	44 6†	45 0†	45 0†	45 0†
New Kleinfonteins	23 4½	23 3*	23 3*	23 4½	23 3*	23 6*
New Modderfonteins	—	—	377 6†	380 0†	—	380 0†
New Rietfonteins	1 0	—	1 3†	1 0*	1 0	—
New Unifeds	—	—	—	11 6*	11 6*	11 6*
Nourse Mines	—	—	—	21 0†	—	—
Pretoria Cements	76 6*	76 6*	77 6*	77 6*	79 0†	79 0†
Princess Estates	1 9†	—	—	—	2 0†	2 0†
Rand Collieries	—	—	2 0*	2 0*	2 0*	—
Rand Klips	9 8	9 6	9 6*	9 8	9 4*	9 5
Rand Nucleus	1 6	1 5*	1 4*	1 5*	1 5*	1 4*
Randfontein Deeps	5 1*	5 3*	5 4*	5 4*	5 9	7 8
Randfontein Estates	—	13 6*	13 9*	15 3	16 3	18 0
Rooiberg Minerals	9 0	8 9	9 0†	8 0*	8 6*	9 0†
Rondepoort Unifeds	9 6†	10 0†	10 0†	9 0*	9 0*	—
Ryan Nigels	2 6*	—	—	2 6*	—	—
Shobas	—	—	1 0*	—	1 0*	—
Simmer Deeps	4 0†	3 6*	4 0†	3 6	4 0†	4 0†
S.A. Breweries	28 0*	28 0*	28 0*	—	28 0*	28 0*
S.A. Lands	4 10†	4 9	4 8	4 7	4 7*	4 9
Springs Mines	57 9	56 9	58 0	58 9	58 9*	61 3
Sub Nigels	23 9*	24 0	23 6*	23 9*	23 7½	24 0
Swaziland Tins	—	—	30 0†	—	—	—
Transvaal and Delagoa	—	14 0†	—	—	—	—
Rand Selections	68 0*	67 9*	68 0	68 0*	68 3*	69 6
Transvaal Lands	11 0*	—	14 0†	—	14 0†	14 0†
Transvaal G.M. Estates	16 6*	16 0*	—	—	17 6*	18 6*
Van Ryn Deeps	69 6	69 0*	70 0	69 9	69 6*	69 6
Village Deeps	29 0†	—	28 9†	29 0†	29 0†	29 0†
Village Main Reefs	—	17 6*	—	—	—	—
Welgedachts	—	20 0†	17 6*	—	17 6*	—
Western Rand Estates	—	1 6*	1 9†	—	1 9†	1 9†
Witwatersrand Deeps	20 0†	18 0*	18 6*	18 6*	18 6*	19 0*
Wolluters	9 9	9 9	9 7*	9 6*	9 6*	9 7*
Zaaiplaats Tins	7 8	7 6*	7 4*	7 8	7 6*	7 3*

There were buyers during the week of Union 5 per cent. Loan at prices ranging from £99 16s. to £100.

*Buyers. †Sellers. A Odd lots. B Ex London

November Company Registrations.

Man Chun Pok Hing Company, Ltd., corner Green and Geoffrey Streets, Roodepoort; capital £1,000.
 Die Helpmekeer Vereniging in Transvaal, Beperk, 29 Erasmus Gebouwen, Kerkplein, Pretoria; capital £12 10s.
 Chambers & Company, Ltd., 1st Floor, Dive Buildings, 125 Commissioner Street, Johannesburg; capital £3,000.
 Natal Fisheries, Ltd., 314 Church Street, Pretoria; capital £4,000.
 Sol. Jacobson & Son, Ltd., 47a Pim Street, Johannesburg; capital £2,000.
 Khin & Company, Ltd., Plein Street, Lichtenburg; capital £500.
 Traders, Ltd., 12 and 13 Rosenberg Arcade, Market Street, Johannesburg; capital £1,000.
 K. M. Kagdi & Sons, Ltd., Seventeenth Street, Vrededorp; capital £1,000.
 Abdoola Amod & Company, Ltd., Sackville Street, Amsterdam, Transvaal; capital £500.
 Hullan Bros., Ltd., 7 New Club Buildings, 7 Loveday Street, Johannesburg; capital £100,000.
 Acme Art Cleaners and Dyers, Ltd., 31 Schoeman Street, Pretoria; capital £1,000.
 The Sullivan Music Studios, Ltd., 34 Bree Street, Johannesburg; capital £100.
 Milner Pharmacy, Ltd., 78a Harrison Street, Johannesburg; capital £500.
 Desai, Ltd., 12 Rosenberg Arcade, 58 Market Street, Johannesburg; capital £1,500.
 Lomati Estates, Ltd., 95 Cullinan Buildings, Simmonds Street, Johannesburg; capital £30,000.
 Cassim Ali, Ltd., 288 Asiatic Bazaar, Pretoria; capital £30,000.
 G. W. Sheahan & Company, Ltd., 28 Moseley Buildings, Johannesburg; capital £1,000.
 John Swift, Ltd., 65 Bree Street, Johannesburg; capital £3,500.
 Osman Ali, Ltd., Kruger Street, Potchefstroom; capital £2,500.
 Rietkol Stores, Ltd., "Rietkol," Eloff Station, District Pretoria; capital £3,000.
 M. E. Tilly & Son-in-law, Ltd., Kimberley Street, Klerksdorp; capital £3,000.
 Ebrahim Ismail, Ltd., 58 Main Reef Road, Denver; capital £200.
 Laher, Ltd., 183, corner End and Market Streets, Johannesburg; capital £200.
 The Nylstroom Pyramid Syndicate, Ltd., Erf 48, Main Street, Nylstroom; capital £200.
 Abdool Latief, Ltd., corner Market and Devenish Streets, Pietersburg; capital £1,000.
 Kelhnan Brothers, Ltd., 14 and 16 Bureau Street, Pretoria; capital £2,000.
 Rahman, Ltd., Carmichael Street, Ventersdorp; capital £1,000.

The New Agatha Fruit Boxmaking and Timber Company, Ltd., New Agatha, district of Pietersburg; capital £500.
 The Carbis Mines, Ltd., 21 Norwich Union Buildings, Fox Street, Johannesburg; capital £500.
 Ismail Ahmod Haffjee, Ltd., 50 Avenue Road, Fordsburg; capital £100.
 Laloo Khoosal, Ltd., 63 Market Street, Krugersdorp; capital £500.
 Maritz & Company, Ltd., Joubert Street, Ermelo; capital £500.
 Union Corporation, Ltd., National Bank Buildings, Simmonds Street, Johannesburg; capital £100.

FOREIGN COMPANIES.

Outeniqua Strand Estate, Ltd., care John Fleming Orr, Trust Buildings, Fox Street, Johannesburg; capital £2,000.
 Walter C. Airey & Company, Ltd., care W. Wilkinson, Dowell Buildings, Loveday Street, Johannesburg; capital £25,000.
 Aliwal Diamond Prospecting Syndicate, Ltd., care T. E. Duckles, 83 84 Exploration Buildings, Johannesburg; capital £5,000.

ALTERATIONS AND ADDITIONS TO FOREIGN COMPANIES.

Spitzkop Colliery Ltd., Johannesburg.
 The Grikaland West Board of Executors, Trust and Agency Company, Ltd., Johannesburg.

SPECIAL AND EXTRAORDINARY RESOLUTIONS.

The Smallholdings Company, Ltd., Johannesburg; sale of township.
 The Ventersdorp Lime Works, Ltd., Johannesburg; liquidation.
 Bluff Lands Company, Ltd., Pretoria; liquidation.
 Nil Desperandum Syndicate, Ltd., Johannesburg; liquidation.
 Elvena Gold Mines, Ltd., Johannesburg; liquidation.
 H. Mosehke, Ltd., Pietersburg; liquidation.
 S.A. Nitrates, Ltd., Johannesburg; increase of capital.
 Kenilworth Hall, Ltd., Johannesburg; bond.
 City Wine and Spirit Company, Ltd., Pretoria; liquidation.
 Potchefstroom Farmer's Produce Agency, Ltd., Potchefstroom; increase of capital.

NOTICES OF INCREASE OF CAPITAL.

Andresen & Company, Ltd., Pretoria; from £1,075 to £1,550.
 Pombal Exploration Syndicate, Ltd., Johannesburg; from £5,750 to £10,000.
 Dickinsons, Ltd., Pretoria; from £2,000 to £3,000.

IN LIQUIDATION.

The Ventersdorp Lime Works, Ltd., Johannesburg; capital £2,000.
 Bluff Lands Company, Ltd., Pretoria; capital £14,000.
 Nil Desperandum Syndicate, Ltd., Johannesburg; capital £5,000.
 Elvena Gold Mines, Ltd., Johannesburg; capital £3,000.
 City Wine and Spirit Company, Ltd., Pretoria; capital £1,500.
 Siemens, Ltd., Johannesburg; capital £100,000.
 Cottages, Ltd., Johannesburg; capital £1,500.

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Engineering Notes and News.

ELECTRICAL SYSTEM OF THE RAND POWER COMPANIES, WITH SPECIAL REFERENCE TO METHODS OF OPERATION AND EXPERIENCE.—IV.

[By BERNARD PRICE, M.I.E.E., Assoc.M.Inst.C.E., Past-President, S.A.I. of E.E.]

As regards maintenance work, it is clearly economical that the time during which machines are out of commission should be a minimum at all stations excepting Rosherville, because any idle plant at these stations has to be replaced by plant at Rosherville during day load. For this reason it pays to work overtime on repairs and overhauls at Vereeniging, Brakpan and Simmer Pan stations. The above considerations determine the kilowatt loading at the various stations, and to that extent define the transmission loss, but as this loss is dependent upon the distribution of current, there is still room for economy by intelligent regulation of power factor. Transmission loss may be minimised in two ways, viz.:—(1) By raising to a maximum the power factor of the system as a whole. (2) By reducing to a minimum the distance of transmission of the lagging current on the system. The bulk supply of air already referred to is compressed partly by turbine-driven rotary compressors at Rosherville and partly by electrically-driven rotary compressors at Robinson. There are six compressors at the latter station, each arranged on a pair of shafts, making 12 motors in all. These motors are of the synchronous type rated for 2,000 k.v.a. each, and designed to operate at a power factor of about 90 per cent. on the leading side. Excluding supply to these compressor motors, the power factor of the total output to all consumers averages about 72 per cent. during the day time and 70 per cent. during the night on week-days. When five out of the six Robinson compressors are run, the system power factor during peak hours is raised to close upon 79 per cent., and the combined k.v.a. load is nearly 10,000 k.v.a. less than it would have been if the compressor motors had operated at a lagging power factor of 90 per cent. The pair of motors for any compressor at Robinson, which is not required for compressing air or for standing by as a spare set, are disconnected from the compressor and run up as rotary condensers for power factor correction. Each pair of motors absorbs about 200 k.w. when taking full leading current as a rotary condenser and raises the power factor of the day load on the system by about 1 per cent. The conditions under which it pays to improve the system power factor by operating an idle generator as a rotary condenser have been carefully investigated, and it has been found that whilst it does not pay to do this merely for the purpose of reducing transmission losses, it does pay to run a generator if by so doing a turbine can be shut down. The steam consumption of the turbo-generators obeys Willan's law fairly closely, that is to say, the consumption is made up of a fixed no-load steam consumption plus an approximately constant increment of consumption per increment of output. If by running a generator as a rotary condenser it becomes possible to shut down one turbine unit, the no-load consumption of the latter is saved as against the loss of the power absorbed by the rotary condenser. When brought to a common denominator, the comparison between these

quantities for the Rosherville sets and for the small machines at Simmer Pan is approximately as follows:—Rosherville machines: No-load, 1,200 k.w.; rotary condenser, 660 k.w. Simmer Pan small machines: No-load, 500 k.w.; rotary condenser, 165 k.w. An "idle generator" in this connection means a generator which has been uncoupled from its turbine whilst the latter is undergoing overhaul or repair, the generator being fitted with shaft collars to prevent longitudinal movement. The procedure when starting up the generator is first to connect its stator to the stator of a standing machine, then to excite both rotors from an outside source, and finally to gradually run up the turbine of the second set so that the generators may be synchronised on to the system. Although the transmission pressures are fairly high for the distances involved, conditions occasionally arise which render it difficult to maintain the requisite pressure at all points on the system whilst at the same time adhering to the most economical basis of loading. Under such circumstances, instead of running a generating set at Rosherville during the night merely for the purpose of boosting the pressure, it is preferable to run one of the Rosherville generators as a rotary condenser, thus avoiding uneconomical generation at that station. At Simmer Pan also it pays to run one of the six 3,000 k.w. generators as a rotary condenser, because by this means the power factor of the load carried by the step-down transformers at that station is increased, and as a consequence the output of one of the small generators can be transferred to larger and more economical units in the same station. Methods of the nature described were resorted to with considerable benefit at times of stress in the early days of the scheme when little spare plant was available and initial troubles with new plant were being experienced. As turbines will carry considerable overload with little if any sacrifice in efficiency, the operation of an idle generator to improve the power factor enabled the available plant to deal with a larger load than would otherwise have been possible. As regards the distribution of lagging current over the system, it is obvious that the Vereeniging station must operate at the highest possible power factor so that minimum current may be transmitted over maximum distance. Generating plant in a station like Vereeniging should preferably be specified for a relatively high power factor because additional k.v.a. capacity at that point is of less value than at other stations which are nearer the load. The two 18,000 k.v.a. Vereeniging machines might with advantage be interchanged with two of the 12,000 k.v.a. Rosherville machines, but unfortunately their transformers are not wound for the same pressures. All loaded machines on the Rand, therefore, are normally operated at maximum safe k.v.a. capacity, leaving the sets at Vereeniging to generate at maximum power factor. To this end the machines on the Rand are loaded to maintain full generator temperature from hour to hour and, as is usually the case with modern generators, the rotor temperature has been found to be the limiting condition in every case. It is a relatively simple matter to measure this tem-

*From Journal of the S.A.I. of E.E. Diagrams and references thereto have to be omitted.

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perature while the sets are running. At all stations connections have been run from each machine to a specially calibrated voltmeter placed at the control switchboard, and these connections can be joined at will to separate brushes on the rotor slip-rings of any of the several sets. It has been found by careful tests that for a given rotor current and temperature the pressure across these separate slip-ring brushes is the same whether the rotor be at rest or operating under load, and the simultaneous measurement of this pressure and current enables the resistance and therefore the average temperature of the copper windings to be calculated. In this way the average temperature of the rotor copper of any machine on the system can be regulated to maintain approximately constant full temperature on those sets which are required to generate maximum k.v.a. The rule laid down is that the average copper temperature measured as explained shall not exceed 80 deg. C. under normal conditions and that in emergency it shall not be allowed to exceed 85 deg. C. Whilst it may be contended that 90 deg. C. is quite a safe temperature for the insulating materials used, it has to be remembered that some portions of the rotor copper will be hotter than the average temperature and further that under emergency conditions a short interval of time will elapse before the official in control has obtained knowledge of the temperature. The repair of a large generator rotor is a most difficult and costly proceeding, especially when carried out at a distance of 6,000 miles from a factory, and for these reasons it is prudent to retain a margin of at least 5 deg. C. The effectiveness of the ventilation of the generators varies considerably from season to season. Water spray cooling and washing plant has now been installed on all the large sets, and experience gained with a trial equipment which was in service during the whole of last summer has shown that such plant, in addition to lowering the average temperature, largely reduces the range of temperature variation. The cooling effect is dependent upon the humidity of the atmospheric air and the coincidence of high temperature and high humidity is exceptional. The cooling is therefore most effective when it is most required, namely, when the temperature is greatest. Special tests made before this cooling plant was installed showed that at any given load the temperature of the generator stators and transformers was less than that of the rotors, but it remains to be seen whether the temperature of the transformer wind-

ings has not become the limit under the new conditions. It may eventually prove advantageous to increase the ventilation of the transformers, and an investigation is being made to ascertain the effectiveness of applying forced circulation of the oil in combination with an external oil cooler. It is believed that shell type transformers will be found to lend themselves to this treatment, because with that type it is a relatively easy matter to obtain thorough circulation of the oil throughout the spaces which surround the windings and core. The limiting rating can only be ascertained by measuring the temperature at a number of points suspected of being hot by means of specially inserted electrical thermometers. The power factor of the load carried by the 10,000 volt transmission lines along the Reef is mainly determined by the number of generating units in service at the various stations and, as already explained, this in turn is governed by considerations of economy of generation. The matter is also affected to some extent by limitations in regard to the pressure of distribution over the system. It would not pay to install 40,000 volt pressure regulating boosters for controlling the power factor independently of the pressure of distribution, because such regulators would be expensive and would add considerably to the complication of the system. It is possible, however, to exercise some control over the quantity of current transmitted over the 10,000 volt system at certain times of day, and also to regulate the distribution of current over the 20,000 volt cable network between Roshierville and Robinson, which is fed at both ends. In order to shut down the electrical generating plant at Roshierville each night and to avoid the cost of providing special step-down transformers for feeding the 20,000 volt network from that station, the transformers belonging to a pair of generators have been arranged so that they may be connected in series as a step-down unit. These transformers are three phase 12,500 k.v.a. units having 5,000 volt primaries and 10,000 or 20,000 volt secondaries. There is no switchgear on the 5,000 volt side, but for the purpose mentioned, links have been inserted so that the 5,000 volt windings of the pair may be interconnected, the secondary of one transformer being connected for 40,000 volts and that of the other for 20,000 volts. Whilst transformation loss is doubled, the saving in capital cost by this

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arrangement has been considerable. Experience when switching-out large transformers has shown that an extremely high pressure rise may occasionally occur due no doubt to the dissipation of stored energy in the magnetic circuit of the transformer. To obviate this risk it has been necessary to adopt special methods of operations. Wherever possible large transformers are shut down gradually with a rotating machine, and in other instances arrangements have been made whereby an artificial load may be connected through the spare busbars to the transformer before it is demagnetised. In the case of the pair of generator transformers above mentioned, which represent a capacity of no less than 25,000 k.v.a., a non-inductive metallic resistance is connected to the 5,000 volt circuit before the high tension switches are opened. As regards transformation loss, there is little latitude for saving on a scheme of this type, because the load factor is high and all sub-stations, being static, are without attendants. The losses on a few of the large step-down transformers may be saved by switching-out during periods of light load, but it would not pay to attempt a schedule of routine switching for sub-station transformers. There is one other factor which may influence transmission loss, but which is of greater importance in relation to plant capacity, viz., the lack of symmetry between the currents on the three phases of the system. Very little single phase load is taken by consumers, and the output from sub-stations is virtually a balanced load. As a result, however, of inequality in the magnetising current of individual phases of step-up, step-down and sub-station transformers, the output from generating stations is not symmetrical, the currents flowing in the three phases differing from one another by 5 per cent. to 10 per cent. on the various sections of the system. This lack of symmetry reduces the effective k.v.a. capacity of the system, and also complicates all those measurements which are made by single-phase instruments. It should be possible to very largely reduce this out-of-balance, if not to eliminate it altogether, by reconnecting a number of transformers so that the particular phase-winding which takes the heaviest magnetising current is fed from different phases in different instances. The matter is being investigated from this point of view, and if it is found impossible by these means to entirely correct the balance, it will be advisable where possible to arrange for consumers to take any single phase load they may require from phases which are relatively lightly loaded.

Suitability of Supply.—In order that the supply may be in a form suitable to the consumer, two factors require regulation, viz., pressure and frequency. The generating pressure at Vereeniging, Brakpan and Simmer Pan stations is automatically controlled by Thrill regulators installed on two large machines at each station, and at Vereeniging any pair of machines may be chosen for this purpose. These instruments prevent appreciable fluctuation of pressure, and the average value to which they regulate is varied from

time to time as may be necessary to obtain the desired distribution of lagging current and pressure over the system. Similarly the steam governors on the turbines automatically reduce the range of fluctuation in frequency, and they are remote controlled from the switchboard so that the attendants may adjust the speed when necessary, and especially under emergency conditions. The four large machines recently installed at Brakpan and Simmer Pan are nozzle governed—that is to say, the nozzles through which the steam passes before entering the first Curtis stage of the turbine are provided with valves which are opened or closed by the governor one by one as the load rises or falls. The older sets are governed by throttling at the main stop valve. These nozzle governors are much more sensitive than the throttle governors and in order to prevent wide fluctuations of loading at Brakpan, where maximum output is so desirable, the governors there have been rendered sluggish in action. The Vereeniging sets take very little part in the governing of the system, but the two large sets at Simmer Pan, having nozzle governors, take up the major portion of the fluctuations, whilst some of the remaining sets at Simmer Pan and Rosherville are adjusted to govern as sensitively as possible, the others being set so that the governor is virtually out of action while normal conditions exist. It is more economical to govern on one nozzle at a time than to throttle the steam taken by all nozzles, and for this reason governing is confined to the minimum number of machines required to ensure satisfactory frequency in the event of a portion of the system becoming separated or a large machine being automatically disconnected from the system.

(To be continued.)

South African Society of Civil Engineers.

At a meeting of the South African Society of Civil Engineers held in Capetown recently, a paper by Prof. H. Bohle, entitled "Small Electric Power Stations, with Special Reference to the Worcester Hydro-Electric Scheme," was read. Prof. Bohle remarked that in this country municipalities were separated by great distances, and a supply in bulk was out of the question, except in a few isolated cases. Wherever electric light was desired, a power station had to be erected, resulting in a somewhat large capital expenditure per kilowatt installed, and, consequently, a high charge for energy sold. By carefully designing the plant, it was usually possible to keep the working costs within such limits that the cost per unit sold for lighting purposes did not exceed 1s. maximum. The author went on to describe the principal features of the plant erected for the Worcester Municipality, which had cost approximately £15,000. The total annual costs would amount to about £2,400, so that an average income of £200 per month would be required to make ends meet. Of this sum £55 per month would result from street lighting, leaving an amount of £145 per month from private consumers. The system had not been officially opened many weeks, and the income had already reached the required sum. At Stellenbosch, a town somewhat similar to Worcester, the scheme cost only £10,900. The figures for the first year showed working costs amounting to £488, the income being from public lighting £500, and from private consumers £1,688. The whole profit made during the first year had been put to depreciation and sinking fund. The figures showed that, with judicious working, even a small power station might be made a very profitable undertaking.

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The Week's Meetings.

DAGGAFONTEIN MINES.

The annual general meeting of shareholders of the Daggafontein Mines, Ltd., was held on December 15, in the company's board room, Corner House. The chair was taken by Mr. F. R. Lynch, and there were also present Messrs. J. Munro, H. S. J. Hall, P. Dreyfus, A. P. Richter, J. Davidson, H. C. Boyd, W. S. Webber, J. A. Cohen, and Aubrey Hyman.

The Chairman, in moving the adoption of the report and accounts, said:—Gentlemen,—You have been called together to-day in order to comply with the requirements of the Companies Act, which prescribes that a meeting of shareholders must be held once in every calendar year. The reports and accounts now before you cover the period from the resumption of operations to August 31 last. Your company was registered under the Transvaal Companies Act on March 28 last, with a capital of 530,000 £1 shares, of which 398,033 were issued to the vendors, and 100,000 were issued at par to provide the initial working capital, the balance of 31,967 being held in reserve. Under an agreement entered into with the Consolidated Mines Selection Company, Limited, that company undertook when called upon, within two years from the 28th March last, to take up an additional 200,000 shares at par, thus providing a further £200,000 for working capital. An agreement was also made under which, options were granted to take up a further 500,000 shares as follows:—

Shares.	
To the Daggafontein Gold Mining Co., Ltd.:—	
For three years at par on	134,126
To the Consolidated Mines Selection Co., Ltd.:—	
For three years at par on	115,874
For four years at 22s. 6d. on	125,000
For five years at 25s. on	125,000
	365,874

Making up the total mentioned of ... 500,000

In the articles of association provision is made enabling your directors to give effect to the agreement entered into by increasing the capital of your company by 670,000 shares and should the whole of these shares be issued the capital will stand at £1,200,000.

Assets Acquired.

A detailed schedule of the property and assets acquired from the vendors is set out in the directors' report, and it is not necessary for me to occupy your time by recapitulating it. I may remind you, however, that your company holds the freehold of the greater part of the farm on which the mine is situated, which represents an area of 9,235.4 acres, and it is probable that the extent of your minepacht, when granted, together with the discovery claims, will amount to 1,436 claims. As you will readily understand, the amount of work accomplished during the five months under review was not sufficient to advance our knowledge of the mining prospects of the area to any considerable extent. The plant had to be thoroughly overhauled, the shaft de-watered, and the shaft station cut before development could be commenced. Mining operations were, therefore, only started in earnest in June. From that date to the 31st August the total footage accomplished was 777 feet, of which 360 feet were sampled, averaging 41.12 dwts. over 4.61 inches. Of the footage sampled 36.1 per cent. showed payable values, the average assay value thereof being 74.4wt. over 4.85 inches. Details of development results to the end of September were published in the quarterly report, and were as follows:—Total footage accomplished 1,153, of which 645 feet were sampled, averaging 37.70 dwt. over 4.90 inches. Of the footage sampled 34.9 per cent. was payable, and averaged 72.26 dwts. over 5.09 inches. It now only remains for me to give the total results up to the end of November to bring your information up

to date. These are as follows:—Total footage accomplished, 2,000, of which 1,255 feet were sampled, averaging 40.57 dwts. over 4.97 inches. Of the total footage sampled from the resumption of operations to the 30th November, 44 per cent. showed payable values, and averaged 64.63 dwts. over 5.34 inches.

Encouraging Indications.

Whilst these results do not compare too favourably with some of the results obtained on other properties in the far East Rand area, I think the indications must be regarded as distinctly encouraging. As was to be expected from the results obtained in the shaft, the reef in that vicinity is narrow, but as development has progressed this feature has shown an improvement. During the last week in November the reef was cut in the west haulage, which is the connecting incline with the new shaft. The results for 60 feet so far sampled have averaged 15.2 dwts. over 20 inches. This is very encouraging, especially in view of the width of the reef, which is considerably wider than anything so far encountered. The sinking of the second shaft has been taken in hand at a point some 6,000 feet west of No. 1 shaft, and has now reached a depth of 167 feet, of which 115 feet have been timbered. Your board has entered into a contract with the Victoria Falls and Transvaal Power Company, Limited, for the supply of electric power, the conditions of the agreement being similar to those made by Brakpan Mines and Springs Mines. An agreement has also been entered into with the Rand Water Board for the sale of surplus water pumped from the mine shaft.

The Share Holding.

There is one other matter to which I particularly wish to draw your attention in connection with the reconstruction of this company. No doubt your attention has been drawn to the articles which appeared from time to time in a Johannesburg paper attacking the Consolidated Mines Selection Company, Limited (which company was responsible for the reconstruction of the Daggafontein Gold Mining Company), and criticising the flotation of this company. These articles allege that the Consolidated Mines Selection Company is a German company, German-owned and German controlled, and that the directors—and, incidentally, myself being in charge of the affairs of that company in South Africa—are holding the business for German shareholders. I can only assume that the object of the writer of the articles was to prejudice the Consolidated Mines Selection Company in the eyes of the Government and the public, and that the underlying motive may perhaps have been to so prejudice the chances of one of its subsidiaries that the tender submitted for the lease of the Brakpan Government Mining Area would not be favourably considered. If such was the case, results prove that the efforts in this direction have been futile. As to the allegations themselves in view of the operation of the Trading with the Enemy Act in England, it is really superfluous to do more than deny them. At the outbreak of hostilities the Consolidated Mines Selection Company certainly had four German directors, but, as was the case with all enemy subjects, the declaration of war ipso facto caused them to cease to be directors. In August, 1914, the issued capital of the Consolidated Mines Selection Company was 1,165,000 shares of 10s. each, and I am officially informed that of this number

only 193,500, or approximately 17½ per cent., were held by enemy subjects. These enemies' shares are controlled by the British Board of Trade, and although offers have been made to that body with the object of having them vested in the custodian of enemy property, with a view to their sale—as has been done in other cases—the Board of Trade has decided to take no action in the matter.

Board of Trade Recognition.

Farther, the Board of Trade has allowed the company to continue its business entirely without restriction, which in itself is sufficient to prove its bona fides to any un-biassed person. If additional proof is required, however, it is to be found in the fact that the Imperial Treasury permitted the Consolidated Mines Selection Company to reconstruct the Daggafontein Gold Mining Company, and to provide the funds required for the exploitation of your property. This further establishes the accuracy of my statement, as such privileges are granted only after the fullest inquiries have been made by the Imperial Government, and even then only in exceptional circumstances. All the present directors of the Consolidated Mines Selection Company are well known in the City of London, and in every case they themselves, or their near relatives, are either fighting with the British forces or doing work of national importance. The reflections which have been cast upon their loyalty are not only unwarranted, but most uncalled for, and in my opinion most un-British. Any shareholder in this company who may have had doubts as to the loyalty of the directors of the controlling house or their representatives may safely put such doubts out of mind. As I said before, the sons, brothers, or near relatives of many of us are serving the Empire, and some have made the great sacrifice. In my own case, one brother was killed in Flanders and another seriously wounded. In these circumstances it is unthinkable that I could retain my association with a company which I even suspected of being under German control, or that I could possibly act as a trustee of undisclosed German interests. The head office of the Consolidated Mines Selection Company is in London, and the directors of the company are resident there, which makes it almost impossible for them to repel the attacks or to reply personally to the imputations of disloyalty made against them. I am, however, acquainted with all the gentlemen on the Board, and can give you my assurance that the views expressed by me as to enemy interests are shared to the fullest extent by every one of them. Naturally we are all incensed at the totally unjustifiable nature of the attacks made by the newspaper referred to, and I am glad to take advantage of this, the first suitable opportunity of refuting them. In conclusion, you will, I am sure, wish me to express our appreciation of the able services rendered by our consulting engineer, Mr. C. E. Knecht, our mine manager, Mr. H. W. Pridgeon, and the mine and head office staffs. I now beg to move the adoption of the reports and accounts, as submitted, for the period ended August 31, 1916.

The report and accounts were adopted. Messrs. Alexander Aiken and W. E. Goldby were reappointed auditors.

BREYTEN COLLIERIES.

The annual meeting of shareholders of Breyten Collieries, Ltd., was held on December 15 in the board room, Consolidated Goldfields Buildings. Mr. D. Christopherson presided, and there were also present Messrs. C. Hely-Hutchinson, W. S. Smits, R. O. Stone, F. H. Tarlton, P. S. Wimble, A. Mackie Niven, E. Lewin, A. E. C. Hocking, and A. C. Grant, secretary, representing 48,499 shares out of an issued capital of 90,000 shares.

The Chairman, in moving the adoption of the report and accounts, said:—I propose, in submitting to you the report and accounts for the year ended 31st October, 1916, to deal with first the accounts, secondly the operations for the past year, and, lastly, the prospects for the current year.

Although during the year a further lease of coal rights on the farms Klipfontein, No. 144, and Bankfontein, No. 14, was acquired, property account remains at the same figure in the balance sheet, as the rents for the leases are charged to working costs. Expenditure on equipment has increased by about £11,000, due to provision having to be made for a larger demand for coal from the South African Railways Administration, and also to equip No. 5 adit. The details of this expenditure are given in the directors' report, the principal items being as follows:—Additions to screening plant approach, £1,942; additional Reid locomotive, £3,000; coal cutters and boring machines, £966; underground haulage plant and equipment of No. 5 adit, £1,974. Stores account shows an increase of some £3,600, largely due to increase in the prices owing to war conditions. On the debit side the two items calling for remark are, firstly reserve account, which shows an advanced figure as compared with last year of some £11,000, namely, due to £9,271 having been appropriated from profits for the purpose of capital expenditure and also an amount of £1,709, transferred from renewals fund required for the same purpose. The other item calling for remark is the overdraft at our bankers, amounting to £12,618, which, since the close of the financial year, has been increased to nearly £16,000.

Profit and Loss.

Turning to the profit and loss account you will observe that £9,936 was carried to appropriation account as against £18,261 for the year ended October, 1915. The appropriation account shows that during the financial year two dividends amounting to 12½ per cent. in all, were declared, the total amount paid out on this account being £11,250. After allowing for amounts appropriated for capital expenditure the account is left with a credit balance of £847.

I will now review the operations of the colliery for the past year. From the 1st November to 30th June the average monthly output amounted to about 36,800 tons, during which period a profit of £12,176 was made; so, in view of the larger tonnage which our contracts called for as from the 1st July, 1916, it is reasonable to assume that had no untoward circumstances arisen the profits for the year would have shown a considerable improvement on 1915. Unfortunately, in July two of the compressors broke down, which so interfered with the operations for that month that profits were much reduced. Thereafter our water supply began to fail and resort had to be made to mine water, which worked havoc with our boiler plant, causing endless trouble and much expense. The difficulties so increased that in spite of the efforts of the management the last two months of the financial year showed a total loss of about £3,400, whilst for November a further loss of about £3,000 was made. These losses were somewhat swollen owing to the fact that the management, not being able to make use of all the labour for the production of coal (for October and November the output was only 22,000 tons per month) took the advantage of thoroughly overhauling the plant, especially the compressors and boilers, and also of enlarging the dams, all the expenses in connection with this work being charged out to working costs. The total expenditure in this respect amounted to nearly £2,000.

Water Difficulty.

For some considerable time we had to depend upon mine water, then about the middle of October the position became so bad that we had to arrange for getting a supply of water each day from the Railways to help us out. By the 8th November we had to depend almost entirely upon Railway water, our own dam being empty. It was not until the last few days of November that effective rains fell, and I am glad to say there is now an ample supply of water available. As already mentioned, the capacity of the dam has been increased, but in view of our experience this year I think it is urgent that further provision is made for the water supply. This, however, can only be done when the present rainy season is over, therefore, if it should so happen that during the coming autumn no late rains are experienced and there is delay in the spring rains falling, there is danger of water difficulties again next year. On the other hand, it must be remembered that, since the colliery opened over six years ago, there has up till this year been no difficulty as regards water supply, and even this year heavy storms fell within a radius of five to seven miles from the colliery many weeks before rain fell in this particular catchment area.

Now as regards the prospects for the present financial year, from now on your directors hope that profits will steadily improve. So far as the position underground is concerned, both Mr. Leslie, your superintending engineer, and Mr. Lewis, the manager, state it has never been better. Development is well advanced, whilst the seams in the various adits are showing up coal of equal value to that produced in the past. No. 5 adit has opened up a large area of excellent coal, which can now be more heavily drawn on. The colliery has orders for as much coal as it can supply, so that unless further unforeseen difficulties arise the prospects are favourable for improved results, even as compared with 1915, which was the best year so far recorded for this colliery.

In conclusion, I should like to express our thanks for the kindly and ready assistance given the colliery by the Railway Administration in the way of helping us as far as they could with water. Had it not been that rains fell at Breyten village some time before they fell at the colliery, and thus replenished the water supply in the railway dam, this help could not have been given; but, as it was, when we approached the Administration for help they at once did all they could to assist us. Otherwise the colliery would in October last have had to cease work altogether and the loss would have been more severe. Also, our thanks are due to the Transvaal Coal Owners' Association for having kept our mine customers supplied with any coal we were not able to supply in consequence of our water troubles and their assistance in this respect is much appreciated. I now beg formally to move the adoption of the report and accounts.

Replying to Mr. E. Lewin, the Chairman said it was undesirable to make public the profit per ton which the company made on its coal. The position was different from that of a gold company, where competition was of no account. The large overdraft was entirely due to the unfortunate causes which he had fully explained in his report. From now he hoped they would be able to reduce that overdraft monthly.

The report and accounts were adopted. The retiring auditors, Messrs. Douglas, Low and Co. and Mr. F. A. Stokes were reappointed.

CAROLINA ASBESTOS CO. LTD.

Speaking at the annual meeting of shareholders of the Carolina Asbestos Co., Ltd. on Dec. 15, in the board-room, Con-

solidated Gold Fields Building, the chairman, Mr. Christopherson, said:—No work has been carried on by the lessee during the year under review. You were last year reminded that the present option was extended until such time as was might permit of the lessee restarting operations. Your board, being of the opinion that the time had arrived when it was clear there was no reason why the lessee should not restart work, especially since asbestos properties are now working in South Africa, caused notice to be given on the 26th May of this year that the company would require the option-holder to restart working from 1st July. By giving two months' notice it allowed ample time to make the necessary arrangements to comply with the notice. In the meantime the holder of the option claims that conditions in South Africa owing to the war are such that active operations cannot be carried out on the property. As the point in dispute may have to be carried to the Courts, I do not propose at present to say more on the subject. Expenditure has been kept as low as possible, the total expenditure for the year being £36 18s. 2d., of which no less than about £21 has been expended in connection with the question of the position of the option-holder. I now beg to move the adoption of the report and accounts.

The report and accounts were adopted.

Messrs. J. H. Ryan and J. Jeppe, retiring directors, were re-elected, and the auditors, Messrs. Douglas Low and Co., were reappointed.

ELANDSFONTEIN ESTATE, LTD.

The annual meeting of the Elandsfontein Estate, Ltd., was held on December 15, in the board-room, Consolidated Gold Fields Building.

Mr. D. Christopherson, chairman, in moving the adoption of the report and accounts, said:—At the last annual meeting of shareholders of this company I stated that owing to some 1,150 claims having been abandoned during the last half of the year 1915 the revenue for the financial year ending 31st October, 1916, would be still further reduced. Reference to last year's accounts shows that the reduction for the period under review has amounted to £884, the actual revenue being £2,976, as against £3,860, whilst the amount carried to appropriation account was £1,557, as against £2,384 for the previous year. During the year a dividend of 25 per cent. was declared. A further dividend of 25 per cent. might have been declared before the financial year closed, but your directors decided to wait until provision could be made for a 5 per cent. dividend, which dividend will probably be paid early in 1917. I now beg to move the adoption of the report and accounts.

The report and accounts were adopted.

Messrs. D. Christopherson and F. R. Lynch, retiring directors, were re-elected.

Messrs. Douglas Low and Co. were re-appointed auditors.

MAUSS CONTINUOUS CENTRIFUGAL SEPARATOR, LTD.

The third annual meeting of the shareholders of the Mauss Continuous Centrifugal Separator, Ltd., was held on Dec. 15, in the Trust Buildings, Johannesburg.

In moving the adoption of the directors' report and accounts the Chairman (Mr. J. M. Buckland), after dealing with the finances, said:—For the expenditure that has been incurred we have secured and maintained patent rights in the important countries of the world, and seeing that originally the company only acquired an idea, and that that idea has been worked out and embodied in at least four successive types of machine, gradually approaching to mechanical perfection, it cannot be felt that we have failed to observe careful economy of our resources. We may speak of the succession of machines more freely now, because we have now reached a machine which represents an actual industrial asset. Coming at once, then, to that machine, I may summarise the position in a single sentence by saying that it has accomplished all that was anticipated of it—and more. The claims of the inventor

have been amply vindicated; the successful continuous separation of fluids and solids by centrifugal force has been accomplished at an insignificant cost, and already a very wide field of usefulness lies before you. You have, of course, been compelled to exercise patience. It could not be otherwise. The order for this machine was placed with Messrs. Duncan Stewart and Co., of Glasgow, in July, 1915. Under our instructions it was put through a series of tests before being shipped. It did not leave Glasgow until July, 1916. Even then we were fortunate to get it; if it had remained a month or two longer it is probable that we should not have been able to get it at all.

Machine Erected.

Well, it was taken straight to Zaaipplaats, erected at once, and started running just, so to speak, as it left the manufacturers' yard. It might have been apprehended that its running would at first have been stiff, and its work irregular. Most new machines are like that. This was a success from the start, both mechanically and metallurgically. It ran smoothly and sweetly. Just as it was, it was put to actual work on tin slimes, and although the conditions were in many respects unfavourable, although, for instance, the pulp fed into the machine consisted of 45 volumes of fluid to one of solids, when eight or ten to one is our proper proportion, yet when the product was passed over a vanner, tin concentrates began at once to appear as they have never appeared before in the history of the winning of tin. The treatment of tin slimes all over the world has hitherto been more or less of a failure. The final slime residue of tin metallurgy is in most cases equal in value to the original gold content of most of the ore of the Witwatersrand. From the slimes when separated from the sands any tin metallurgist is fortunate if by the use of a multitude of machines, of literally acres of machines, he can achieve an extraction of anything over 25 per cent. Yet, coupled up with a vanner, this machine, under all manner of disadvantages, in one operation wins 60 per cent of the tin values. It brings about the recovery of tin whose recovery was formerly hopeless. Now, gentlemen, this is a very important piece of work. You are no longer an experimenting syndicate; you occupy a position of serious significance in tin metallurgy all over the world.

Further Improvements.

I may, too, say this, that, striking and important as the results are, Mr. Mauss is already confident of improving upon them. Some minor adjustments, which he is already working out, as the fruit of actual running experience, will in his opinion give him an even cleaner separation, bringing the recovery of tin to a percentage which has never hitherto been approached. I should like to refer with gratitude to the Zaaipplaats Company, and to the courtesy and even enthusiasm with which Mr. Gilbertson and the technical staff at the mine facilitated our observations and our tests. This does not only constitute a demonstration on tin. The machine was originally devised as a means of separating the clear cyanide solution from the sands and slimes pulp passing from agitators in the treatment of gold ores. Its efficiency in that class of work is now assured. Alternatively it may be used in large installations such as those on the Rand for cleaning the slimes after they have been separated from the sands. By the elimination of the colloid matters it will produce a leachable product which can be added to the sands, and treated with the same simplicity and rapidity as they are, with, of course, a slightly higher extraction by reason of the finer division of the particles. In whichever way it may be used the machine will simplify the cyanide process of gold recovery. If the treatment of sands is continued, then it will render unnecessary the elaborate slimes plant which is now, with its tanks and filters, so expensive a part of the surface equipment of a mine. If all sliming is adapted, only agitation and centrifugal

separation will be required. Underground the mining companies are now incurring heavy maintenance costs in pumping to the surface the waters which flow into the deepest parts of the mines. These waters carry gritty particles which are very destructive to the pumps. By the use of this machine the water can be rapidly and cheaply freed of the grit and taken to the pumps as a smooth fluid. But gold and tin alone do not limit your metallurgical field. Silver slimes present a notorious problem. Indeed, many of the most useful devices on the Rand to deal with gold slimes have been adopted from those originally designed to deal with silver-bearing slimes. It is obvious, too, that in copper metallurgy your machine will satisfy a similar demand.

Application to Sugar Making.

But metallurgy is only one of its applications. In industries and manufacture such a machine is now actually demanded in a variety of directions. In sugar making you have, I believe, already considered its utility. It appears likely that it will save 48 hours in the production of sugar from the mill, and 10 per cent, in the cost of manufacture. It is useless to reckon out of the figures of the number of machines that will be required in that vast industry, or the total economy it will effect in the cost of one of the chief foods of mankind. Such figures assume colossal dimensions. But useful as it will be for sugar, it will be almost more so for salt. It will clean and purify brine and solutions of alkaline salts, including the enormous output of Chile nitrates, from the earthy impurities that now add so much to the cost of their preparation. Again in separating the oleic acid from the stearic acid of tallow for the manufacture of soap and candles this machine will effect in an hour an operation which now takes many days.

In the making of wine the minute vegetable particles which remain in the juice after the first fermentation, and which are only removed by slow settlement taking many weeks, will now be separated in a few hours. Probably the largest field which awaits the machine is the purification of town sewage. At present in the case of really great cities this is an insoluble problem. Sewage farms are of little avail when you have to deal with such enormous volumes of fluid as are used, for instance, in transporting the sewage of London to the outfall into the tidal waters of the Thames. Miles of river are polluted. A foul condition of things exists there which no community would tolerate if any remedy were feasible. And an enormous quantity, too, of valuable fertiliser is wasted. The war has taught us that countries can no longer afford to go on squandering their assets. In this machine is presented a means by which the outflow can be converted into a clear fluid, and a solid product capable of industrial use. It is indeed difficult to limit the uses of the machine. Wherever you have to separate solids and fluids, wherever you now use a filter or a filter press, among the commonest of operations, they will be superseded by this cheaper and more rapid means.

Policy of the Board.

I have mentioned to you a few of the fields of utility which await the machine, because now we know that we can fill them. But we are very far from that realisation. Beyond the obvious question of the cost of manufacture, you must remember that one pattern of machine will not serve all these varied ends. Every fresh class of material presents a fresh set of problems. They are now merely problems of calculation, but they have to be solved. For each group of materials demands its own treatment, and questions arise of the physical characteristics of the material, the time, the force, and the speed necessary for the separation de-

sired. Indeed, just as our field of work widens, so widens also our task of research and investigation. And, of course, this brings us back to the question of finance, and policy. Obviously we can follow either of two opposite policies. (1) We can content ourselves by trying to get orders from time to time for a few machines, and gradually to accumulate our working capital out of the profits. The purely industrial problem of manufacture is we may hope solved. The capacity of local industry, especially in engineering, has greatly developed in the last two years; and Mr. Mauss is now satisfied that the machine can be manufactured here for local use much quicker and at approximately the same cost as in England. Or (2) we can formulate at once the necessary scheme for equipping the company with the capital required for the rapid exploitation of the invention. Seeing that in any case the life of patents is short, and that already some years have elapsed, this latter policy is the one that recommends itself to the board. Your directors have already had the subject before them, and it is to be anticipated that the incoming board will call you together at an early date to consider the question of finance.

The Separator at Zaaipplaats.

In seconding the adoption of the report and accounts Mr. E. J. Way said:—The chairman has lucidly expressed in his remarks upon the general position of our company certain information with regard to the experiments which have taken place with the machine purchased by the Zaaipplaats Company, Ltd. In seconding the directors' report and statement of accounts I ask you to give me a few minutes to make clear to you, if possible, the technical aspect of the work done at Zaaipplaats to date in its bearing upon the recovery of tin. These experiments have been carried out under the direct control of representatives of your company and the management at Zaaipplaats, and we are very much indebted to the Zaaipplaats Company and to Mr. Gilbertson for the sympathetic and energetic way in which our wishes have been met in this matter. Mr. Way then read the following letter from the manager at Zaaipplaats:—

Zaaipplaats Tin Mining Co., Limited,
P.O. Sterkwater,
December 13, 1916.

J. M. Buckland, Esq.

Dear Sir, I beg to acknowledge receipt of your letter of the 7th inst., and have pleasure in stating my views on the separator installed at the Zaaipplaats Tin Mine. The performance must be looked at from two points of view, one mechanical and the other metallurgical.

From the mechanical point of view the machine has exceeded expectations. The few alterations which were found necessary were effected at the mine. When the machine has been longer in use no doubt further alterations will be found desirable, but this is only natural when the novel features of the machine are taken into consideration. During the short time at our disposal it was impossible to complete preliminary tests, and to supply conditions which as a result of these tests were found necessary for the attainment of the best results. Nevertheless, the results obtained were highly satisfactory, and indicate that under suitable conditions the separator will fully justify the claims made on its behalf.

Having personally great faith in the Mauss Continuous Centrifugal Separator, I have no hesitation in predicting its success in a wide sphere of application.—I am, dear Sir, yours faithfully,

A. GILBERTSON.

Continuing, Mr. Way said No special arrangements were made at the Zaaipplaats mill for the induction of slime to the machine. As a matter of fact, the current slime product was turned directly into the machine. This current slime product consists of 45 of water to 1 of solid material by volume, and as it has been ascertained that the machine works most satisfactorily on a proportion of 8 or 9 of water to 1 of solid material, it will be patent to the lay mind that the task set for the machine was fairly difficult. It is usual in handling

material of this kind to get rid of as much water as possible by means of dewaterers. These dewaterers the Zaaipplaats Company have inserted for us, and further experimental work will be carried out as soon as it is convenient to the Zaaipplaats Company. Turning back to the actual experiments carried on at Zaaipplaats, you will note that Mr. Gilbertson states that there were practically no mechanical troubles with the machine, and that the metallurgical results obtained were highly satisfactory. I wish to amplify this statement by giving the results of the research of Mr. J. Williams to date.

60 Per Cent. Extraction.

The product from the machine was treated upon Frue vanners, and by means of this treatment and under the somewhat disadvantageous circumstances he finds that an extraction of 60 per cent of the metallic tin was obtained. These extraction results are based upon the mean of assays made by the Zaaipplaats Company, the Roelberg Company and Littlejohn and Whithy. To those who are acquainted with the treatment of slime products from tin mills, a Frue vanner is not considered the most suitable machine to use under the circumstances, and I have found myself that the Diester table gives better results, and I have not the least hesitation in saying that, given the proper proportion of water and solids to the machine and a more suitable concentrating apparatus to handle the product, a much higher extraction would be obtained, and one may commit oneself from the present figures of Mr. Williams to a statement that this result should be in the neighbourhood of 75 per cent. The resulting concentrate from the vanners at Zaaipplaats gives an assay return of from 50 to 55 per cent. metallic tin, which is very nearly a direct marketable article and, with very small losses, could be made saleable. At a neighbouring tin mine a large amount of research and experimental work has led to the laying down of a special plant for the treatment of current slime, after all other means had been exhausted, which plant has given a return of 25 per cent. extraction. The results from our machine are such as to leave no doubt in my mind as to its unqualified success in handling material of this nature, which has been the bane of all mill men in the tin milling industry since time immemorial.

Commercial Aspect.

The commercial aspect is one of the very greatest importance, even from a local point of view, and when I inform you that one mine in the Transvaal possesses stored material of this nature from which, if we are correct in our figures, a profit of at least £100,000 could be made, I am only foreshadowing the importance of this machine for the treatment of tin slime material wherever it is made throughout the world. There is no doubt that the invention has proved conclusively the success of his invention with regard to the continuous separation of colloidal from crystalline matter under disadvantageous circumstances, and I look forward to the time when every tin mill will be equipped with our separator. The separator will not only make it possible to obtain a better extraction, but will do away with the very large quantity of machinery and plant which is now used in extracting tin from slime material. And in stating this I only deal with a portion of its possibilities, because this machine is capable of classifying products at every step of the reduction work in a tin mill, and it may mean the elimination of many of the concentrating devices which are now necessary. Moreover, it has the further undoubted advantages that the power requirements are very small—in this case 2 h.p. per machine—and the space occupied is negligible. The aspect of other possibilities has been touched upon by your chairman, and we possess all the rights in connection with one of the most valuable inventions of modern times and which will have immediate application wherever the separation of liquids from solids is required.

The report and accounts were adopted and the retiring directors (Messrs. J. M. Buckland, W. Mauss, E. J. Pullinger, E. J. Wav and John R. Williams) were re-elected.

ZAAIPLAATS TINS.

The postponed eighth annual general meeting of the Zaaipplaats Tins Mining Company, Limited, was held at the offices of the company in Pretoria on Dec. 19. Sir Thomas K. Murray presiding. Shareholdings totalling 99,764 were represented. Those present were Messrs. M. Solomon, J. Tindall, A. E. Thornhill, F. K. Murray, J. Munro, G. H. Dunlop, G. Benjamin, J. H. Wagner, S. A. Klagsbrun, J. Benjamin, G. Haines, A. Gilbertson (manager), and H. P. Webber (secretary).

In dealing with the report of the directors and the manager, and the statement of accounts for the year ended July 31, 1916, the Chairman said:—“I regret that we have had to submit such poor results before you. The net profit for the year only amounted to £3,290, as compared with £24,631 for the previous year. The reason for this serious falling off in profits is due to the reduced quantity of concentrates produced, and this reduction is in itself due to the fact that the ore producing sections of the mine fell off considerably. The total quantity of concentrates produced was 531 long tons as compared with 699 long tons produced for the previous year. Comparing these figures with two years back the output for the year under review is 676 tons less, while the tonnage produced during the year ended 31st July, 1915, was 508 tons more. These figures will serve to show how serious the falling off in the production has been during the last two years. As I have already stated, the poor results with which I am now dealing are most regrettable, but, gentlemen, it is quite clear that if the mine has been incapable of producing ore for treatment on the same scale as it has done in the past, the profits must necessarily drop. From the reports before you it will be seen that your board has endeavoured to reduce expenditure in order to meet the reduction in revenue, and I think you will agree with me when I state that we have accomplished this successfully in bringing the costs down to 21s. 10d. per ton treated. This figure is 4s. 2d. per ton less than the figure for the year 1913-1914, and 6s. per ton less than for the year 1914-1915. During the past three months the total working costs have been reduced on an average by £1,200 per month, as compared with the past year. From the balance sheet it will be seen that the company had £6,380 available in the form of cash at the end of July, that is, after including the reserve fund of £6,000. I would here like to state that since the end of the year it has been necessary to withdraw the whole of this reserve fund in order to meet the present position. The accounts before you are very clearly drawn up, and any further information you may require can readily be obtained therefrom.

THE PRESENT POSITION.

“I would now like to refer to the purchase of the T.C.L. Company's lease, commonly known as the ‘Zaaipplaats Lease,’ which was effected during the year. On the 25th of March last a circular was addressed to all shareholders notifying them of this transaction. This property was purchased mainly on account of the possibility of our ore bodies passing into it. The surface prospects were taken in hand vigorously and active work was commenced on the ore bodies previously worked, about the beginning of May last, and up to the end of last month 18,285 tons of ore were mined, of which 10,022 tons were transported to the mill. The total quantity of concentrates recovered is 76 long tons of 69 per cent tin. The present position is that practically all ore developed under the pegmatite has been worked out, and the latest developments indicate that ordinary methods of development will not be immediately successful. We believe, however, that tin occurs under the pegmatite in other places, beneath the surface, and we shall have to consider the question of carrying on exploitation work in this area on a larger

scale. We are continuing to obtain ore from the low-grade dumps left by our predecessors and we will in due course take in hand the treatment of the alluvium. Turning now to the work at the mine, you will remember that in the speech delivered to you last year I stated how difficult and dangerous it was to make any forecast of the future, and I then also endeavoured to explain to you how erratic the ore bodies are. The results for the past year fully support these views as the ore bodies have behaved in the most extraordinarily erratic manner during the year, and this fact has been the direct cause of all our difficulties. Nothing of real importance has taken place in the mine throughout the year, but about the beginning of November a slight improvement took place in the north-western face in No. 13 section, and by the end of that month the manager reported that this discovery was turning out to be more like the true extension of the main ore body than anything which had been discovered in this section for a considerable time. The latest information is that this face has consistently improved and is now about 25 by 12 feet in size, carrying high-grade ore, and there appears little doubt that it is the true extension. In addition to this recent discovery the manager also reported at the end of November that a branch ore body termed ‘E’ Branch had improved greatly in value. This body is now about five feet in diameter, and is also carrying high-grade ore. Work is being pushed ahead as rapidly as possible on these two bodies. On the 30th November you were notified that the board had decided to temporarily suspend crushing operations. This step was taken, I understand, with a view to endeavouring, by carrying on development work only, to place the mine in a more satisfactory position as regards its ore reserves. But, gentlemen, I was not present at the board meeting when this policy was adopted and I personally did not approve of the action. Since then, however, you will no doubt have noticed the statement in the Press to the effect that it was decided to restart crushing operations on the 11th instant. The Zaaipplaats Mine is, I am sure, one of the most difficult tin propositions to work. Mining cannot be done in the ordinary orthodox way by driving, cross-cutting, and winzling, but we have to follow the bodies as they appear in all their ramifications; the result being that there is no consistency about the underground workings, which twist and turn in every direction. The manager, therefore, is unable to ‘block out’ ore reserves in the mine and the only way a reserve of ore can be established is by placing the ore in dumps on the surface. I would take this opportunity of stating that, in deference to the wishes of the manager, the board have engaged the services of Dr. Corstorphine to make a report on the mine from a geological standpoint. This report, when received, should contain valuable information concerning the vagaries of the ore bodies and should prove of great assistance to the manager. We have received a preliminary report which I will now ask the secretary to read.”

Dr. Corstorphine's Report.

The secretary read the following report of Dr. Corstorphine:—

[Copy.]

Dear Sir.—In accordance with the request conveyed in your letter of November 29 I visited Zaaipplaats last week, and spent three days there with my assistant, Mr. D. P. McDonald, who had preceded me by a few days. We came to the conclusion that a somewhat prolonged study of the geological conditions would be necessary before there was any probability of our being able to report with advantage to the company. The main problems which require attention are:—(1) The relation of the different varieties of granite to each other; (2) the time relationship of the pipes and the pegmatite; (3) the influence of fissures on the contents of the pipes. Whether one can reach a decision as to the mode of origin of the various deposits,

and as a result arrive at a reasonable scheme of prospecting are important questions which can be answered only after considerable study. The various sections of the property ought to be seen at different times, and the behaviour of the tin-bearing rock, whether in the pipes or in the fissures, or in the pegmatite, will have to be studied. To see the conditions just at one time does not lead to much result in a problem such as this; and, with the Board's consent, I should like to make the more prolonged study which I consider necessary. In the meantime the exploration of No. 13 pipe should be continued. One has again been found, and is likely to behave now as it has in the past. I consider that the work should be continued on the plan adopted by the manager, and it does not appear to me that much can be gained by ceasing crushing. It should be borne in mind that development, as usually understood, cannot be carried out at Zaaipplaats. The only ore reserve which could be created would be a stack of ore either in the mine or at the surface, but the expense of such a plan would be excessive. As regards pipes 5 and 6, I am unable at present to suggest any explanation of the absence of ore below the fissure. The influence of the fissures on the ore contents of the pipes should be studied as a whole, and is one of the problems to which I shall devote some time. The tin on the Zaaipplaats lease ground lies below the pegmatite sheet, and prospecting operations will best be carried out if one secures some definite information as to the relationship of the pegmatite and the rest of the granite. The tin occurring on the Roodepoort lease ground is again different, occurring in fissures. I may say that my present visit confirmed the high opinion I formed in 1913 of the very systematic and careful manner in which the manager, Mr. Gillvertson, follows up every indication either of tinstone or of pipe rock. Mr. McDonald will visit the property at intervals during the next two months, and I shall myself visit it with him at a later date.

The Chairman then concluded his remarks by expressing the hope that the company might have a more prosperous future than experienced in recent months.

Mr. M. Solomon, who was re-elected a director, explained to the meeting that it was he who gave the order for the restarting of the mill a short while ago. He had acted on the advice of Dr. Constorphine.

The accounts were adopted, and the meeting closed with a vote of thanks to the chairman, the meeting having first expressed its unanimous confidence in the manager of the property.

CHAMBER OF MINES.

The quarterly meeting of the Transvaal Chamber of Mines was held on Dec. 18. There were present Messrs. E. A. Wallers (president), W. Dalrymple, F. R. Lynch, H. Newhouse, F. Raleigh, J. F. Rutherford, A. G. Gill, W. I. Graham, F. J. Benard, G. C. Fitzpatrick, R. M. Conolly, J. Andrew Cohen, W. H. B. Frank, P. Cazalet, H. Warren, W. S. Smits, A. C. Mullins, M. Honnet, C. McIntjies, H. O. Maccall, D. W. Rossiter, H. A. Rogers, G. Faleke, J. Jourdan, A. F. Lyall, H. Stuart Martin, H. G. Panchaud, A. Gregor, T. G. Sater, W. J. Gau, W. Ross, P. Richardson, W. Gemmil, and C. R. Kelsey, secretary.

The President said:—Gentlemen: The financial position is clearly stated in the report, and I do not think requires further comment.

With regard to the native labour position, the total number of natives employed by the members of the Witwatersrand Native Labour Association, Ltd., at 30th November, was 213,178, as compared with 209,314 at 1st September, 1916. There has been a marked increase in the number employed on coal mines, the number being 11,118 at the end of November, as compared with 10,841 at the beginning of September. This increase is chiefly due to heavy A.L. demands for coal. The total

number of natives engaged during the three months was 61,128, of whom 20,274 were East Coast natives and 41,151 British South African natives. The total wastage was 58,505, of which 15,175 were East Coast natives, and 43,330 British South African natives. The considerable gain on the East Coast native position was particularly useful in view of the heavy demands of the collieries already mentioned, which demands are, as you know, satisfied chiefly from East Coast recruits. I am very pleased to state that the native death rate from disease for the year to date has been the lowest on record, amounting to 11.02 per 1,000 per annum, as compared with 14.84 per 1,000 per annum in 1914, the previous lowest death rate.

As you are aware, a native labour contingent for service in Europe has been recruited by the Union Government at the request of the Imperial Government, and I trust that the experiment will prove a success. I think, however, that the contingents of Chinese labourers that are being obtained are more likely to stand the climate, and that in the circumstances the employment of Chinese will probably give better results than the employment of natives.

Since our last meeting the industry has suffered the loss of an official who has been connected with it for many years: I refer to the death of Dr. G. A. Turner, which took place on October 27. Dr. Turner was the medical adviser (natives) to the Chamber, but for many years he had been Chief Medical Adviser of the Witwatersrand Native Labour Association. His valuable work on that association is known to you all, and it is indeed regrettable that we have to record his death.

Invalided Soldiers.

Special matters arising out of the war continue to engage the attention of the Chamber. As you know, about 2,400 mine employees have been on active service in East Africa, and in view of the large number of these men who have been invalided, the Chamber has felt it necessary to make urgent representations to the Government on the advisability of establishing a hospital on the Witwatersrand for the treatment of invalided soldiers. Government hospitals are provided at Roberts Heights and Potchefstroom, but clearly it will be impracticable in many cases for returned soldiers to proceed to these places, and in view of the large number of men from the Rand, it appears only right that a hospital should be established here. I am glad to say that the Defence Department met this request in a most sympathetic way, and is assisting in the equipment and maintenance of a hospital now established at the Wanderers' Grounds by the Official Advisory Committee on Voluntary Aid, which is also being helped in the matter by the Governor-General's Fund. Should the accommodation in this hospital be found insufficient, one or two mine hospitals will be placed at the disposal of the committee, while there is no doubt that emergency cases may arise along the Reef will be taken in at any of the mine hospitals just as ordinary emergency cases are always accepted by these hospitals. I think you will agree that the arrangements I have mentioned are most satisfactory and likely to prevent a great deal of hardship. The importance of effectively treating diseases such as malaria and dysentery at the commencement is very great, as otherwise attacks will continue to recur, and the individual will become a chronic invalid. I therefore trust that returned soldiers affected by these diseases will not fail to take advantage of the facilities offered, which I may state include not only the treatment of in-patients, but also free medical advice to out-patients. In addition to the pro-

vision of hospital accommodation, a convalescent home has been opened at Sunnyside, which was kindly lent for the purpose by the Council of the South African School of Mines.

Re-employment.

Arrangements having thus been made for the treatment of invalided soldiers, the question of re-employment of mine employees returning from active service is also receiving attention. In the great majority of cases the mine employees on active service obtained the permission of the management before volunteering, and in all such cases their billets are being kept open for them. It will no doubt, however, be necessary, in addition, to attempt to absorb a number of the men who have been engaged to take the place of those who proceeded on active service, and your Executive Committee has appointed a sub-committee to consider this question. The very important matter of the employment and the vocational re-education of disabled soldiers, which has received a great deal of attention in Europe and in Canada, is being dealt with by a special committee of the Governor-General's Fund on which two members of your Executive Committee have been appointed.

You will remember that in 1915 the Chamber, at the request of the Imperial Government, sent 200 munition workers to England. These men proved most satisfactory, and I am pleased to say that we have been able to carry out a further request to furnish 20 engineer construction draughtsmen.

The provision of the necessary mining supplies for the bulk of the industry continues to be supervised by the Central Buying Committee, and the arrangements under which the Chamber issues certificates for the importation of absolutely necessary supplies have proved of great assistance in this connection. While the stock of supplies held by the industry is such as to obviate any immediate anxiety, yet I think we must all realise that more and more difficulty will be experienced in obtaining supplies from overseas, and that the strictest economy in the consumption of stores by the mines must be exercised.

I am sure you will agree with me it is very satisfactory that, as a result of the recent examination in anatomy and physiology for the certification of mine nurses, conducted by the Transvaal Medical Council, 54 out of 60 candidates who are employed by the gold mining industry as either superintendents or European attendants in native mine hospitals were successful. It is not easy, in my opinion, for men who for the most part have been engaged for many years in the practical work of a hospital to work up for and pass, while so engaged, a theoretical examination in the preliminary subjects of their profession such as anatomy and physiology. They are the more to be congratulated. The successful candidates are now attending lectures preparatory to their final examination in general, surgical and medical nursing, which will be held in April, 1917. A second course of lectures in anatomy and physiology is also being held to enable those employees who were unable to be spared when the last course was held to sit for the examination, and to enable the unsuccessful candidates to revise their knowledge.

Training of Miners.

Since the last ordinary meeting of the Chamber, I am happy to inform you, the scheme for increasing very considerably the facilities for the training of miners has assumed practical shape. At the suggestion of the Hon. the Minister of Mines and Industries, who has shown the greatest interest in the scheme, representatives of the Government and of the gold mining industry met and unanimously reported in detail on the subject of training schools for miners. This report has

been adopted by the Government and by your executive committee. There has been no delay in getting to work. By notice in the Union Gazette a Board of Control has already been appointed. The Government Mining Engineer, the Chief Inspector of Mines, the Adviser on Technical Education to the Union, and a professor of mining at the South African School of Mines and Technology are members of the board, and I think I may state that the Minister's appointment of the remaining members, who are all actively engaged in the gold mining industry, are thoroughly representative. It is hoped that the J. B. Robinson Group, which I understand is sympathetic to the scheme, will shortly participate similarly to other groups. The Board of Control is at the present time actively engaged in considering the question of the adaptation of certain buildings on what is thought to be a most satisfactory site on the property of the Bantjes Consolidated Mines, Ltd., for the purpose of one of the schools, which it is hoped will be open and available to pupils early in 1917.

It is the intention of the board to select a site and proceed immediately with the building of a further school to be situated on the far East Rand, and it is hoped that this building will be available for pupils in the course of next year. The suggestion is ultimately to have six schools of this nature along the Reef capable of accommodating 600 apprentices. No premium is required from the apprentice; on the contrary he is paid, and becomes self-supporting from the day that he commences work. Further, at the completion of his two years' apprenticeship, he will receive a preference over all other candidates for employment on the mines, and six months' employment will be guaranteed him at the rates prevailing on the mines, if the apprentice has attained the age of 21 years, but in any case the rate will not be less than 16s. 8d. per shift. To ensure this preference the various gold mining companies, mem-

bers of the Chamber, have undertaken not to engage as underground learners youths under the age of 23 years while vacancies exist at, and candidates are available for, any of the Government Miners' Training Schools.

The establishment of various schools along the Reef will afford opportunities to apprentices, by their transference from one school to another, as occasion and their knowledge permit, to obtain experience of the varied conditions of mining existing on the Witwatersrand.

As I stated at our last meeting, having regard to the measures that are being taken and the success that is being obtained in eradicating miners' phthisis, there is now no reason why these schools should not afford valuable opportunities for the employment of the South African youth. Without training in these schools the greater proportion of the large and increasing number of South African-born men who are taking up mining as a trade will always remain semi-skilled workmen, and will not command the high wages offered by mining companies to first rate miners. In establishing these schools the Government and the industry have provided a remedy for this state of affairs, and it remains for the youth of the country to take advantage of its opportunity.

As you will see from the report, a committee thoroughly representative of the mining industry was appointed to consider what representations the Chamber should make on the proposed amendments to the Mines and Works Regulations. The amendments are very numerous in nature, and are contained in a pamphlet of some 30 pages. The Chamber's representations are under the consideration of the Government. Various alterations to the draft amendments have been submitted, and the Chamber was able to suggest others in the interests of health and safety, as a result of the knowledge gained by the investigations of the Miners' Phthisis Prevention Committee and the Safety First Committee respectively.

As you will see from the report, evidence was given by the Chamber before the State Mining Commission on the inadvisability of the State undertaking gold mining operations if private enterprise were available on reasonable terms. That evidence has been fully reported in the Press, and I do not propose to reiterate it, or to comment on the evidence that has been tendered to the Commission, and which is at the present time under its consideration.

Local Industries.

At the annual meeting of the Chamber in March, 1916, Sir Lionel Phillips suggested that the mining industry should endeavour to foster promising local industries by establishing an Industrial Bank or Finance Company, which would financially assist such concerns. I am pleased to say that four of the mining groups, namely, the Johannesburg Consolidated Investment Company, Consolidated Mines Selection, A. Goerz and Company, and the Central Mining and Investment Corporation, have agreed to participate in such a company, as have also the National and Standard Banks, and steps are now being taken to form a company, with an initial capital of £100,000. I am glad to be able to state that Messrs. Alexander Aiken, W. A. Martin, and Robert Niven have agreed to join the board of the company, a fact which I think you will agree is an excellent augury of success. I now beg to move the adoption of the report of the Executive Committee for the three months ended November 30, 1916.

Mr. W. T. Graham, in seconding the motion, said he should like to congratulate the Government and the Executive for what they had done in regard to the youths of the country in establishing six training schools. It will prove a great boon to them, and also should prove in the course of time a great service to the mines.

The motion was carried, and the meeting terminated.

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(INCORPORATED IN THE TRANSVAAL.)

DECLARATION OF DIVIDEND No. 31.

A DIVIDEND of eleven and one quarter (11 $\frac{1}{4}$) per cent. (two shillings and threepence per £1 (one pound) share) has been declared by the Board for the period ending 31st December, 1916, payable to Shareholders registered in the Books of the Company at the close of business on 31st December, 1916, and to holders of Coupon No. 31 attached to Share Warrants.

The Transfer Books will be closed from the 1st to the 7th January, 1917, both days inclusive.

The Warrants in payment of this dividend will be despatched as soon as possible after the 3rd of February, 1917, but, owing to the irregularity in the mail service, there may be a delay of one or two weeks.

Warrants despatched from the London Office to persons resident in the United Kingdom will be subject to a deduction of English Income Tax, and those despatched to persons resident in France will be subject to a deduction on account of French Transfer Duty and Income Tax.

Coupon No. 31 attached to Share Warrants will be payable on or after 5th February, 1917, at the London Office of the Company, and at the Credit Mobilier Français, 30 and 32, Rue Taitbout, Paris. Coupons must be deposited FOUR CLEAR DAYS before being paid.

Coupons paid by the London Office, unless accompanied by Inland Revenue Declarations, will be subject to a deduction of English Income Tax. Coupons paid by the London Office to or on account of persons resident in France, and those paid by the Credit Mobilier Français, will be subject to a deduction on account of French Transfer Duty and Income Tax.

By Order of the Board,

RAND MINES, LIMITED,

Secretaries.

S. C. STEIL,

Secretary.

Head Office:

The Corner House,
Johannesburg.

15th December, 1916.

Robinson Gold Mining Co., LIMITED.

(Incorporated in the Transvaal.)

DECLARATION OF DIVIDEND No. 49.

A DIVIDEND of Four (4 per cent.) per cent. (Four Shillings per Five Pound (£5) share) has been declared by the Board for the period ending 31st December, 1916, payable to Shareholders registered in the Books of the Company at the close of business on 31st December, 1916, and to holders of Coupon No. 44 attached to Share Warrants.

The Transfer Books will be closed from the 1st to the 7th January, 1917, both days inclusive.

The Warrants in payment of this dividend will be despatched as soon as possible after the 3rd of February, 1917, but, owing to the irregularity in the mail service, there may be a delay of one or two weeks.

Warrants despatched from the London Office to persons resident in the United Kingdom will be subject to a deduction of English Income Tax.

Coupon No. 44, attached to Share Warrants, will be payable on or after 5th February, 1917, at the London Office of the Company. Coupons must be deposited four clear days before being paid, and unless accompanied by Inland Revenue Declarations, they will be subject to a deduction of English Income Tax.

By Order of the Board,

RAND MINES, LIMITED, Secretaries.

S. C. STEIL, Secretary.

Head Office: The Corner House,

Johannesburg, 15th December, 1916.

Modderfontein "B" Gold Mines, Ltd.

(Incorporated in the Transvaal.)

Declaration of Dividend No. 9.

A DIVIDEND of Forty (40) per cent. (Eight Shillings per £1 (One pound) share) has been declared by the Board for the period ending 31st December, 1916, payable to Shareholders registered in the Books of the Company at the close of business on 31st December, 1916, and to holders of Coupon No. 9, attached to Share Warrants.

The Transfer Books will be closed from the 1st to the 7th January, 1917, both days inclusive.

The Warrants in payment of this dividend will be despatched as soon as possible after the 3rd of February, 1917, but, owing to the irregularity in the mail service, there may be a delay of one or two weeks.

Warrants despatched from the London Office to persons resident in the United Kingdom will be subject to a deduction of English Income Tax, and those despatched to persons resident in France will be subject to a deduction on account of French Transfer Duty and Income Tax.

Coupon No. 9, attached to Share Warrants, will be payable on or after 5th February, 1917, at the London Office of the Company, and at the Credit Mobilier Français, 30 and 32, Rue Taitbout, Paris. Coupons must be deposited four clear days before being paid.

Coupons paid by the London Office, unless accompanied by Inland Revenue Declarations, will be subject to a deduction of English Income Tax. Coupons paid by the London Office to or on account of persons resident in France, and those paid by the Credit Mobilier Français will be subject to a deduction on account of French Transfer Duty and Income Tax.

By Order of the Board,

RAND MINES, LIMITED, Secretaries.

S. C. STEIL, Secretary.

Head Office: The Corner House,

Johannesburg, 15th December, 1916.

Nourse Mines, Limited.

(Incorporated in the Transvaal.)

Declaration of Dividend No. 25.

A DIVIDEND of Six and a Quarter (6 $\frac{1}{4}$) per cent. (One Shilling and Threepence per One Pound (20/-) share) has been declared by the Board for the period ending 31st December, 1916, payable to Shareholders registered in the Books of the Company at the close of business on 31st December, 1916, and to holders of Coupon No. 25 attached to Share Warrants.

The Transfer Books will be closed from the 1st to the 7th January, 1917, both days inclusive.

The Warrants in payment of this dividend will be despatched as soon as possible after the 3rd of February, 1917, but, owing to the irregularity in the mail service, there may be a delay of one or two weeks.

Warrants despatched from the London Office to persons resident in the United Kingdom will be subject to a deduction of English Income Tax.

Coupon No. 25, attached to Share Warrants, will be payable on or after 5th February, 1917, at the London Office of the Company. Coupons must be deposited four clear days before being paid and unless accompanied by Inland Revenue Declarations, they will be subject to a deduction of English Income Tax.

By Order of the Board,

RAND MINES, LIMITED, Secretaries.

S. C. STEIL, Secretary.

Head Office: The Corner House,

Johannesburg, 15th December, 1916.

Village Deep, Limited.

(INCORPORATED IN THE TRANSVAAL.)

DECLARATION OF DIVIDEND No. 17.

A DIVIDEND of ten (10) per cent. (two shillings per £1 (one pound) share) has been declared by the Board for the period ending 31st December, 1916, payable to Shareholders registered in the Books of the Company at the close of business on 31st December, 1916, and to holders of Coupon No. 17 attached to Share Warrants.

The Transfer Books will be closed from the 1st to the 7th January, 1917, both days inclusive.

The Warrants in payment of this dividend will be despatched as soon as possible after the 3rd of February, 1917, but, owing to the irregularity in the mail service, there may be a delay of one or two weeks.

Warrants despatched from the London Office to persons resident in the United Kingdom will be subject to a deduction of English Income Tax, and those despatched to persons resident in France will be subject to a deduction on account of French Transfer Duty and Income Tax.

Coupon No. 17 attached to Share Warrants will be payable on or after 5th February, 1917, at the London Office of the Company, and at the Credit Mobilier Français, 30 and 32, Rue Taitbout, Paris. Coupons must be deposited FOUR CLEAR DAYS before being paid.

Coupons paid by the London Office, unless accompanied by Inland Revenue Declarations, will be subject to a deduction of English Income Tax. Coupons paid by the London Office to or on account of persons resident in France, and those paid by the Credit Mobilier Français, will be subject to a deduction on account of French Transfer Duty and Income Tax.

By Order of the Board,

RAND MINES, LIMITED,
Secretaries.
S. C. STEIL,
Secretary.

Head Office :
The Corner House,
Johannesburg,
15th December, 1916.

New Modderfontein G.M. Co. LIMITED.

(Incorporated in the Transvaal.)

Declaration of Dividend No. 21

A DIVIDEND of sixteen and one quarter (16¼) per cent. (thirteen shillings per £4 (four pound) share) has been declared by the Board for the period ending 31st December, 1916, payable to Shareholders registered in the Books of the Company at the close of business on 31st December, 1916, and to holders of Coupon No. 21 attached to Share Warrants.

The Transfer Books will be closed from the 1st to the 7th January, 1917, both days inclusive.

The Warrants in payment of this dividend will be despatched as soon as possible after the 3rd of February, 1917, but, owing to the irregularity in the mail service, there may be a delay of one or two weeks.

Warrants despatched from the London Office to persons resident in the United Kingdom will be subject to a deduction of English Income Tax.

Coupon No. 21, attached to Share Warrants, will be payable on or after 5th February, 1917, at the London Office of the Company. Coupons must be deposited four clear days before being paid, and unless accompanied by Inland Revenue Declarations, they will be subject to a deduction of English Income Tax.

By Order of the Board,

RAND MINES, LIMITED, Secretaries.
S. C. STEIL, Secretary.

Head Office: The Corner House,
Johannesburg, 15th December, 1916.

RAND MINES, LIMITED

(Incorporated in the Transvaal.)

Declaration of Dividend No. 27

AN INTERIM DIVIDEND of seventy-five (75) per cent. (three shillings and ninepence per five shillings share) has been declared by the Board for the period ending 31st December, 1916, payable to Shareholders registered in the Books of the Company at the close of business on 31st December, 1916, and to holders of Coupon No. 27 attached to Share Warrants.

The Transfer Books will be closed from the 1st to the 7th January, 1917, both days inclusive.

The Warrants in payment of this dividend will be despatched as soon as possible after the 10th of February, 1917, but, owing to the irregularity in the mail service, there may be a delay of one or two weeks.

Warrants despatched from the London Office to persons resident in the United Kingdom will be subject to a deduction of English Income Tax, and those despatched to persons resident in France will be subject to a deduction on account of French Transfer Duty and Income Tax.

Coupon No. 27 attached to Share Warrants will be payable on or after 12th February, 1917, at the London Office of the Company, and at the Credit Mobilier Français, 30 and 32, Rue Taitbout, Paris. Coupons must be deposited FOUR CLEAR DAYS before being paid.

Coupons paid by the London Office, unless accompanied by Inland Revenue Declarations, will be subject to a deduction of English Income Tax. Coupons paid by the London Office to or on account of persons resident in France, and those paid by the Credit Mobilier Français, will be subject to a deduction on account of French Transfer Duty and Income Tax.

By Order of the Board,

S. C. STEIL,
Secretary.

Head Office: The Corner House,
Johannesburg,
15th December, 1916.

CROWN MINES, LTD.

(Incorporated in the Transvaal.)

Declaration of Dividend No. 31.

A DIVIDEND of Twenty-five (25) per cent. (Two Shillings and Sixpence per 10s. (Ten Shilling) share) has been declared by the Board for the period ending 31st December, 1916, payable to Shareholders registered in the Books of the Company at the close of business on 31st December, 1916, and to holders of Coupon No. 31 attached to Share Warrants.

The Transfer Books will be closed from the 1st to the 7th January, 1917, both days inclusive.

The Warrants in payment of this dividend will be despatched as soon as possible after the 3rd of February, 1917, but, owing to the irregularity in the mail service, there may be a delay of one or two weeks.

Warrants despatched from the London Office to persons resident in the United Kingdom will be subject to a deduction of English Income Tax, and those despatched to persons resident in France will be subject to a deduction on account of French Transfer Duty and Income Tax.

Coupon No. 31, attached to Share Warrants, will be payable on or after 5th February, 1917, at the London Office of the Company, and at the Credit Mobilier Français, 30 and 32, Rue Taitbout, Paris. Coupons must be deposited four clear days before being paid.

Coupons paid by the London Office, unless accompanied by Inland Revenue Declarations, will be subject to a deduction of English Income Tax. Coupons paid by the London Office to or on account of persons resident in France, and those paid by the Credit Mobilier Français will be subject to a deduction on account of French Transfer Duty and Income Tax.

By Order of the Board,

RAND MINES, LIMITED, Secretaries.
S. C. STEIL, Secretary.

Head Office: The Corner House,
Johannesburg, 15th December, 1916.

CITY DEEP, LIMITED,

(Incorporated in the Transvaal.)

Declaration of Dividend No. 9.

A DIVIDEND of Twenty-two and One-half (22½) per cent. (Four Shillings and Sixpence per £1 (One Pound) share) has been declared by the Board for the period ending 31st December, 1916, payable to Shareholders registered in the Books of the Company at the close of business on 31st December, 1916, and to holders of Coupon No. 9 attached to Share Warrants.

The Transfer Books will be closed from the 1st to the 7th January, 1917, both days inclusive.

The Warrants in payment of this dividend will be despatched as soon as possible after the 3rd of February, 1917, but, owing to the irregularity in the mail service, there may be a delay of one or two weeks.

Warrants despatched from the London Office to persons resident in the United Kingdom will be subject to a deduction of English Income Tax, and those despatched to persons resident in France will be subject to a deduction on account of French Transfer Duty and Income Tax.

Coupon No. 9, attached to Share Warrants, will be payable on or after 5th February, 1917, at the London Office of the Company, and at the Credit Mobilier Français, 30 and 32, Rue Taitbout, Paris. Coupons must be deposited four clear days before being paid.

Coupons paid by the London Office, unless accompanied by Inland Revenue Declarations, will be subject to a deduction of English Income Tax. Coupons paid by the London Office to or on account of persons resident in France, and those paid by the Credit Mobilier Français will be subject to a deduction on account of French Transfer Duty and Income Tax.

By Order of the Board,

RAND MINES, LIMITED, Secretaries.

S. C. STEIL, Secretary.

Head Office: The Corner House,
Johannesburg, 15th December, 1916.

Geldenhuis Deep, Limited.

(Incorporated in the Transvaal.)

DECLARATION OF DIVIDEND No. 34.

A DIVIDEND of Twelve and one-half (12½) per cent. (Two Shillings and Sixpence per £1 (One pound) share) has been declared by the Board for the period ending 31st December, 1916, payable to Shareholders registered in the Books of the Company at the close of business on 31st December, 1916, and to holders of Coupon No. 34 attached to Share Warrants.

The Transfer Books will be closed from the 1st to the 7th January, 1917, both days inclusive.

The Warrants in payment of this dividend will be despatched as soon as possible after the 3rd of February, 1917, but, owing to the irregularity in the mail service, there may be a delay of one or two weeks.

Warrants despatched from the London Office to persons resident in the United Kingdom will be subject to a deduction of English Income Tax, and those despatched to persons resident in France will be subject to a deduction on account of French Transfer Duty and Income Tax.

Coupon No. 34, attached to Share Warrants, will be payable on or after 5th February, 1917, at the London Office of the Company, and at the Credit Mobilier Français, 30 and 32, Rue Taitbout, Paris. Coupons must be deposited four clear days before being paid.

Coupons paid by the London Office, unless accompanied by Inland Revenue Declarations, will be subject to a deduction of English Income Tax. Coupons paid by the London Office to or on account of persons resident in France, and those paid by the Credit Mobilier Français will be subject to a deduction on account of French Transfer Duty and Income Tax.

By Order of the Board,

RAND MINES, LIMITED, Secretaries.

S. C. STEIL, Secretary.

Head Office: The Corner House,
Johannesburg, 15th December, 1916.

The Village Main Reef Gold Mining Co., LIMITED.

(Incorporated in England.)

DIVIDEND No. 31.

NOTICE IS HEREBY GIVEN that a dividend of Fifteen per cent. (Three Shillings per share) has been declared payable to all Shareholders registered in the Books of the Company on the 30th December, 1916.

The local Transfer Books of the Company will be closed from the 1st to the 6th January, 1917, both days inclusive.

Dividend Warrants in favour of South African Registered Shareholders will be payable in Johannesburg on or about 31st January, 1917.

By Order of the Local Board of Directors.

RAND MINES, LTD., Local Secretaries.

S. C. STEIL, Local Secretary.

The Corner House, Johannesburg,
Transvaal, 18th December, 1916.

WITWATERSRAND DEEP, LTD.

(Incorporated in the Transvaal.)

NOTICE IS HEREBY GIVEN that a Dividend of Ten per cent. (10 per cent.) for the six months ending 31st December, 1916, equal to 2s. per share, has been declared payable to Shareholders registered on the 31st December, 1916. Dividend Warrants will be paid out as soon as practicable after the receipt of the London Transfer Returns to that date.

Holders of Share Warrants to Bearer are informed that they will receive payment of the Dividend on presentation of Coupon No. 22 at the London Office of the Company, Salisbury House, London Wall, E.C.

The Transfer Registers will be closed from the 1st to the 6th January, 1917, both days inclusive.

By Order of the Board,

H. G. L. PANCHAUD, Secretary.

Head Office, Johannesburg,
15th December, 1916.

Consolidated Main Reef Mines and Estate, Ltd.

(Incorporated in the Transvaal.)

DIVIDEND No. 17.

NOTICE IS HEREBY GIVEN that a Dividend of Five per cent. (5 per cent.) for the six months ending 31st December, 1916, equal to 1s. per share, has been declared payable to Shareholders registered on the 31st December, 1916. Dividend Warrants will be paid out as soon as practicable after the receipt of the London Transfer Returns to that date.

Holders of Share Warrants to Bearer are informed that they will receive payment of the Dividend on presentation of Coupon No. 14 at the London Office of the Company, Salisbury House, London Wall, E.C.

The Transfer Registers will be closed from the 1st to the 6th January, 1917, both days inclusive.

By Order of the Board,

H. G. L. PANCHAUD, Secretary.

Head Office, Johannesburg,
15th December, 1916.

Witbank Colliery Limited.

(Incorporated in the Transvaal.)

Notice to Shareholders.

NOTICE IS HEREBY GIVEN that the Sixteenth Ordinary General Meeting of Shareholders in the above-mentioned Company will be held in the Company's Board Room, Cullinan Building, Johannesburg, on Friday, the 26th January, 1917, at 11 a.m.

BUSINESS:—

1. To receive the Report of the Directors and the Financial Statements to the 31st August, 1916.
2. To elect three Directors in the place of Messrs. H. A. Rogers, J. H. Ryan and C. S. Goldmann, who retire in terms of the Company's Articles of Association, but, being eligible, offer themselves for re-election.
3. To appoint Auditors for the ensuing year, and to fix the remuneration for the past audit.
4. To transact any other business which may be transacted at an Ordinary General Meeting, or which is brought under the consideration of the Meeting by the Report of the Directors.

The London Transfer Registers of the Company will be closed from the 28th December, 1916, to 6th January, 1917, both days inclusive, and the Head Office Transfer Registers of the Company will be closed from the 23rd January, 1917, to the 9th February, 1917, both days inclusive.

By Order of the Board,

H. G. L. PANCHAUD, Secretary.

Johannesburg, 12th October, 1916.

Swaziland Tin, Limited.

(Incorporated in the Transvaal.)

DIVIDEND No. 18.

NOTICE IS HEREBY GIVEN that an Interim Dividend, No. 18, of Ten per cent. (2s. per share), has been declared by the Board, payable to all Shareholders registered in the Books of the Company at the close of business on the 31st day of December, 1916.

The Share Transfer Books will be closed from the 1st day of January to the 7th day of January, 1917, both days inclusive.

The Dividend Warrants will be posted to Shareholders from the Head Transfer Office on or about the 15th day of January, 1917.

By Order of the Board,

Transvaal Consolidated Land and Exploration Co., Ltd., Secretaries.

W. E. S. LEWIS, Secretary.

Head Office, The Corner House,
Johannesburg, 15th December, 1916.

THE

Natal Navigation Collieries and Estate Company, Limited.

Notice of Dividend (No. 28).

SHAREHOLDERS ARE HEREBY NOTIFIED that the Directors have declared a dividend of three and three-quarters per cent. (Ninepence per share) for the half-year ending December 31st, 1916, payable to all shareholders registered as such in the Company's books on the 31st December, 1916.

Dividend Warrants will be issued as soon as possible after receipt of returns from the London Office.

The Transfer Books of the Company will be closed from January 1st to January 8th, both days inclusive.

By Order of the Board,

J. T. JONES, Secretary.

28, Natal Bank Chambers,
Durban, 14th December, 1916.

The City and Suburban Gold Mining and Estate Co., Ltd.

(Incorporated in Natal.)

NOTICE IS HEREBY GIVEN that a Dividend of 5s. per share has been declared payable to all Shareholders registered on the 30th December, 1916.

J. WEIGHTON, Secretary.

Head Office, Pietermaritzburg,

Natal, 14th December, 1916.

RAND WATER BOARD (Engineer's Department).

CONTRACT No. 154.

TENDERS ARE HEREBY INVITED for the Supply of about 7,000 tons of Portland Cement.

For particulars apply to the office of the Chief Engineer, Rand Water Board, where copies of the Contract Documents may be obtained upon a deposit of five guineas, on and after the 18th inst.

The Board is not bound to accept the lowest or any tender.

All tenders are to be deposited at the office of the Secretary, Rand Water Board, Central House, or P.O. Box 1703, Johannesburg, by or before 12 noon on Tuesday, the 23rd January, 1917.

INGHAM, M.Inst.C.E., M.I.Mech.E.,

Chief Engineer.

The Jupiter Gold Mining Company,

LIMITED

(Incorporated in the Transvaal.)

Declaration of Interim Dividend No. 5.

NOTICE IS HEREBY GIVEN that an Interim Dividend of $3\frac{3}{4}$ per cent. (Ninepence per share), amounting to £38,032 10s., has been declared for the six months ending 31st December, 1916, being at the rate of $7\frac{1}{2}$ per cent. per annum, payable on 25th January, 1917, to Shareholders registered in the Company's Books on 30th December, 1916.

The Transfer Books of the Company will be closed from 1st to 8th January, 1917, both days inclusive.

The Dividend will be payable to Shareholders on the South African Register by warrants to be issued from the Head Office of the Company in Johannesburg, and to Shareholders on the London Register by warrants to be issued from the London Office of the Company.

By Order of the Board,

The Consolidated Gold Fields of South Africa, Ltd., Secretaries

Per A. C. GRANT.

Head Office:

Consolidated Gold Fields Buildings,

Simmonds Street, Johannesburg,

19th December, 1916.

Tell advertisers you saw it in the *South African Mining Journal*.

The Simmer & Jack Proprietary Mines,

LIMITED

(Incorporated in the Transvaal.)

Declaration of Interim Dividend No. 29.

NOTICE IS HEREBY GIVEN that an Interim Dividend of $3\frac{3}{4}$ per cent. (Ninepence per Share), amounting to £112,500, has been declared for the six months ending 31st December, 1916, being at the rate of $7\frac{1}{2}$ per cent. per annum, payable on 9th February, 1917, to Shareholders registered in the Company's Books on 30th December, 1916.

The Transfer Books of the Company will be closed from 1st to 8th January, 1917, both days inclusive.

The Dividend will be payable to Shareholders on the South African Register by warrants to be issued from the Head Office of the Company in Johannesburg, and to Shareholders on the London Register by warrants to be issued from the London Office of the Company.

Holders of Share Warrants to Bearer are informed that they will receive payment of the Dividend on presentation of Coupon No. 29, either at the Offices of the African Banking Corporation, Limited, 63, London Wall, London, E.C., or at the Offices of The Consolidated Gold Fields of South Africa, Limited, at 12, Rue des Pyramides (being the Paris Agents of the Company). Coupons will be payable at any time on or after 9th February, 1917, and must be left for examination at either of the foregoing addresses at least four clear days prior to payment being made.

By Order of the Board,

The Consolidated Gold Fields of South Africa, Ltd., Secretaries.
Per A. C. GRANT.

Head Office:
Consolidated Gold Fields Buildings,
Simmonds Street, Johannesburg,
19th December, 1916.

ROBINSON DEEP, LTD.

(Incorporated in the Transvaal.)

Declaration of Dividend No. 2 ("A" Shares).

NOTICE IS HEREBY GIVEN that Dividend No. 2, on "A" Shares, of 4s. (Four Shillings) per share, amounting to £100,000, has been declared for the six months ending 31st December, 1916, payable on 23rd February, 1917, to Shareholders of "A" Shares registered on 30th December, 1916.

The Transfer Books of the Company will be closed from 1st to 8th January, 1917, both days inclusive.

The Dividend will be payable to Shareholders on the South African Register by warrants to be issued from the Head Office of the Company in Johannesburg, and to Shareholders on the London Register by warrants to be issued from the London Office of the Company.

Holders of Share Warrants to Bearer are informed that they will receive payment of the Dividend on presentation of Coupon No. 2, either at the Offices of the African Banking Corporation, Limited, 63, London Wall, London, E.C., or at the Offices of The Consolidated Gold Fields of South Africa, Limited, at 12, Rue des Pyramides (being the Paris Agents of the Company). Coupons will be payable at any time on or after 23rd February, 1917, and must be left for examination at either of the foregoing addresses at least four clear days prior to payment being made.

By Order of the Board,

The Consolidated Gold Fields of South Africa, Ltd., Secretaries.
Per A. C. GRANT.

Head Office:
Consolidated Gold Fields Buildings,
Simmonds Street, Johannesburg,
19th December, 1916.

THE SUB NIGEL, LIMITED

(Incorporated in the Transvaal.)

Declaration of Interim Dividend No. 8.

NOTICE IS HEREBY GIVEN that an Interim Dividend of 5 per cent. (One Shilling per Share), amounting to £21,579, has been declared for the six months ending 31st December, 1916, being at the rate of 10 per cent. per annum, payable on 9th February, 1917, to Shareholders registered in the Books of the Company on 30th December, 1916.

The Transfer Books of the Company will be closed from 1st to 8th January, 1917, both days inclusive.

The Dividend will be payable to Shareholders on the South African Register by warrants to be issued from the Head Office of the Company in Johannesburg, and to Shareholders on the London Register by warrants to be issued from the London Office of the Company.

By Order of the Board,

The Consolidated Gold Fields of South Africa, Ltd., Secretaries
Per A. C. GRANT.

Head Office:
Consolidated Gold Fields Buildings,
Simmonds Street, Johannesburg,
19th December, 1916.

THE KNIGHTS DEEP, LTD.

(Incorporated in the Transvaal.)

Declaration of Interim Dividend No. 23.

NOTICE IS HEREBY GIVEN that an Interim Dividend of 10 per cent. (Two Shillings per Share), amounting to £74,352 12s., has been declared for the six months ending 31st December, 1916, being at the rate of 20 per cent. per annum, payable on 26th January, 1917, to Shareholders registered in the Company's Books on 30th December, 1916.

The Transfer Books of the Company will be closed from 1st to 8th January, 1917, both days inclusive.

The Dividend will be payable to Shareholders on the South African Register by warrants to be issued from the Head Office of the Company in Johannesburg, and to Shareholders on the London Register by warrants to be issued from the London Office of the Company.

By Order of the Board,

The Consolidated Gold Fields of South Africa, Ltd., Secretaries
Per A. C. GRANT.

Head Office:
Consolidated Gold Fields Buildings,
Simmonds Street, Johannesburg,
19th December, 1916.

The Cassel Coal Co., Ltd.

(Incorporated in the Transvaal.)

DECLARATION OF DIVIDEND No. 13.

NOTICE IS HEREBY GIVEN that a Dividend (No. 13) of $6\frac{1}{4}$ per cent., equal to 1s. 3d. per share, has been declared, payable to Shareholders registered in the Books of the Company at the close of business on Saturday, the 30th day of December, 1916.

By Order of the Board,

T. L. DAY, Secretary.

Lace Building, 74, Fox Street,
Johannesburg, 19th December, 1916

Meyer & Charlton Gold Mining Co., LIMITED.

(Incorporated in the Transvaal.)

DIVIDEND No. 54.

NOTICE IS HEREBY GIVEN that a Dividend of Fifty-five per cent. (55 per cent.), equal to eleven shillings (11s.) per Share (making, together with the Dividend of 45 per cent. declared in June last, a total Dividend of 100 per cent. for the financial year ending 31st December, 1916), has been declared by the Board of Directors for the half-year ending 31st December, 1916, payable to all Shareholders registered at that date, and to Holders of Coupon No. 37 attached to Share Warrants to Bearer.

Warrants in payment of this Dividend will be issued to European Shareholders from the London Office, and to South African Shareholders from the Head Office, Johannesburg, as soon as possible after the receipt at Head Office of the London Transfer Lists to 31st December, 1916.

Holders of Share Warrants to Bearer will receive payment (11s. per Share) in exchange for Coupon No. 37, at any of the undermentioned Offices of the Company:—

Head Office: General Mining Buildings, Johannesburg.
London Offices: 63-64, Winchester House, E.C.
Paris: At the Credit Lyonnais, 19, Boulevard des Italiens.

Coupons must be left four clear days for examination and may be presented any day after the 1st February, 1917.

The Transfer Registers will be closed from the 1st to the 7th January, 1917, both days inclusive.

By Order,

J. V. BLINKHORN.

Secretary.

General Mining Buildings,
Marshall Square (P.O. Box 1173),
Johannesburg, 14th December, 1916.

New Goch Gold Mines, Ltd.

(Incorporated in the Transvaal.)

DIVIDEND No. 9.

NOTICE IS HEREBY GIVEN that a Dividend of Five per cent. (5 per cent.), equal to one shilling (1s.) per Share (making, together with the Dividend of 5 per cent. declared in June last, a total Dividend of 10 per cent. for the financial year ending 31st December, 1916), has been declared by the Board of Directors for the half-year ending 31st December, 1916, payable to all Shareholders registered at that date, and to Holders of Coupon No. 9 attached to Share Warrants to Bearer.

Warrants in payment of this Dividend will be issued to European Shareholders from the London Office, and to South African Shareholders from the Head Office, Johannesburg, as soon as possible after the receipt at Head Office of the London Transfer Lists to 31st December, 1916.

Holders of Share Warrants to Bearer will receive payment (1s. per Share) in exchange for Coupon No. 9, at any of the undermentioned Offices of the Company:—

Head Office: General Mining Buildings, Johannesburg.
London Offices: 63-64, Winchester House, E.C.
Paris: At the Credit Lyonnais, 19, Boulevard des Italiens.

Coupons must be left four clear days for examination and may be presented any day after the 1st February, 1917.

The Transfer Registers will be closed from the 1st to the 7th January, 1917, both days inclusive.

By Order,

J. V. BLINKHORN,

Secretary.

General Mining Buildings,
Marshall Square (P.O. Box 1173),
Johannesburg, 14th December, 1916.

Van Ryn Gold Mines Estate, Limited.

(Incorporated in the United Kingdom.)

DIVIDEND No. 26.

NOTICE IS HEREBY GIVEN that the Board of Directors have declared an Interim Dividend of Seventeen and one-half per cent. (17½ per cent.) (3s. 6d. per Share), less Income Tax, for the half year ending 31st December, 1916.

The Dividend now declared will be payable to all Shareholders registered on the 31st December, 1916. Dividend Warrants will be posted from London to Shareholders on the European Register on the 17th January, 1917, and to Shareholders on the South African Register from Johannesburg at the beginning of February.

Holders of Share Warrants to Bearer must present Coupon No. 26:—

In London: At the Registered Office of the Company, 63-64, Winchester House, E.C.

In Paris: At the Credit Lyonnais, 19, Boulevard des Italiens.

The Coupons must be left for examination for four clear days.

The Books of the Company will be closed from the 1st to the 11th January, 1917, both days inclusive.

By Order of the Board,

J. V. BLINKHORN, .

Local Secretary.

General Mining Buildings,
Marshall Square (P.O. Box 1173),
Johannesburg, 14th December, 1916.

MINERS' PHTHISIS BOARD.

BENEFICIARIES of the above Board who desire to be placed on a land settlement to be established by the Board in terms of Section 6 (c) of Act 44/1916, should apply by letter to The Secretary, Phthisis Board, P.O. Box 4566, Johannesburg, stating:—

- What fixed property they own;
- What stock they own;
- Their previous experience in agriculture.

All applications must be marked on the envelopes "Land Settlement," and must reach this office not later than the 10th January, 1917.

Only about 30 applicants can be provided for.

A. C. MARSH, Acting Secretary.

Consolidated Langlaagte MINES, LIMITED.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

DIVIDEND No. 7.

NOTICE IS HEREBY GIVEN that a Dividend of Ten per centum (Two Shillings per share) has been declared payable to Shareholders registered at the 31st December, 1916, as soon as the necessary returns are received from the London Office. The Transfer Books will be closed from the 1st to the 10th January, 1917, both days inclusive.

By Order of the Board,

Johannesburg Consolidated Investment Co., Ltd., Secretaries.

Per FRANK HALL.

Head Office, Consolidated Building
(P.O. Box 590), Johannesburg,
20th December, 1916.

Ginsberg Gold Mining COMPANY, LIMITED.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

DIVIDEND No. 27.

NOTICE IS HEREBY GIVEN that a Dividend of Seven and one-half per centum (One Shilling and Sixpence per share) has been declared payable to Shareholders registered at the 31st December, 1916, as soon as the necessary returns are received from the London Office.

The Transfer Books will be closed from the 1st to the 10th January, 1917, both days inclusive.

By Order of the Board,

Johannesburg Consolidated Investment Co., Ltd., Secretaries.

Per FRANK HALL.

Head Office, Consolidated Building
(P.O. Box 590), Johannesburg,
20th December, 1916.

New Unified Main Reef GOLD MINING COMPANY, LIMITED.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

DIVIDEND No. 17.

NOTICE IS HEREBY GIVEN that a Dividend of Ten per centum (Two Shillings per share) has been declared payable to Shareholders registered at the 31st December, 1916, as soon as the necessary returns are received from the London Office.

The Transfer Books will be closed from the 1st to the 10th January, 1917, both days inclusive.

By Order of the Board,

Johannesburg Consolidated Investment Co., Ltd., Secretaries.

Per FRANK HALL.

Head Office, Consolidated Building
(P.O. Box 590), Johannesburg,
20th December, 1916.

New Primrose Gold Mining COMPANY, LIMITED.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

DIVIDEND No. 47.

NOTICE IS HEREBY GIVEN that a Dividend of Five per centum (One Shilling per share) has been declared payable to Shareholders registered at the 31st December, 1916, as soon as the necessary returns are received from the London Office.

The Transfer Books will be closed from the 1st to the 10th January, 1917, both days inclusive.

By Order of the Board,

Johannesburg Consolidated Investment Co., Ltd., Secretaries.

Per FRANK HALL.

Head Office, Consolidated Building
(P.O. Box 590), Johannesburg,
20th December, 1916.

Van Ryn Deep, Limited.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

DIVIDEND No. 7.

NOTICE IS HEREBY GIVEN that a Dividend of Twenty per centum (Four Shillings per share) has been declared

payable to Shareholders registered at the 31st December, 1916, as soon as the necessary returns are received from the London Office.
The Transfer Books will be closed from the 1st to the 10th January, 1917, both days inclusive.

By Order of the Board,

Johannesburg Consolidated Investment Co., Ltd., Secretaries

Per FRANK HALL.

Head Office, Consolidated Building
(P.O. Box 590), Johannesburg,
20th December, 1916.

Witwatersrand Gold Mining COMPANY, LIMITED.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

DIVIDEND No. 25.

NOTICE IS HEREBY GIVEN that a Dividend of Twenty-five per centum (Five Shillings per share) has been declared payable to Shareholders registered at the 31st December, 1916, as soon as the necessary returns are received from the London Office.

The Transfer Books will be closed from the 1st to the 10th January, 1917, both days inclusive.

By Order of the Board,

Johannesburg Consolidated Investment Co., Ltd., Secretaries.

Per FRANK HALL.

Head Office, Consolidated Building
(P.O. Box 590), Johannesburg,
20th December, 1916.

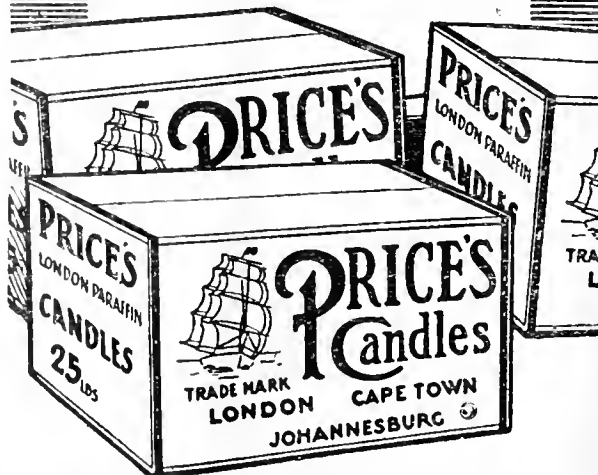
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South Africa.

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When communicating with advertisers, kindly mention the *South African Mining Journal*.

SOUTH AFRICAN RAILWAYS & HARBOURS.

DINGAAN'S DAY,

Christmas and New Year Holidays,

1916-1917.

GENERAL EXCURSION FARES will operate between stations on the South African Railways, N.C.C. Railways, B. & M. & R. Railways (all stations), and C.F.L.M. (through bookings only) during the period 1st December, 1916, to 6th January, 1917, inclusive.

AVAILABILITY OF RETURN: Between stations which are more than 25 miles apart, three months including days of issue and return. Between stations which are 25 miles or less apart, within four days including days of issue and return.

Return journeys to or from the B. & M. & R. Railways (north of Mafeking) must be completed by midnight on the 31st January, 1917, except tickets issued to Capetown, stations Capetown-Simonstown, and Somerset Strand, Port Elizabeth, Mossel Bay, George, Port Alfred and East London, which will be available for three months including days of issue and return.

CAPE SUMMER SEASON.

In addition to the above-mentioned General Excursion Fares, **CHEAP TICKETS** will be issued one day each week during the period 7th January to the end of March, 1917 (February, from stations north of Mafeking), to Capetown, stations Capetown-Simonstown and Somerset Strand; and to Mossel Bay, George, Port Alfred, Port Elizabeth and East London one day each week during period 7th January to end of February, 1917, from stations in the Transvaal, Orange Free State, Rhodesia (north of Mafeking) and B. & M. & R. Railways, and from certain stations in the Cape Province.

DAYS OF ISSUE IN THE TRANSVAAL:

TO CAPETOWN, etc.—By the 3.30 p.m. special train ex Johannesburg via Fourteen Streams on Wednesdays or nearest suitable connection to join that train. Stations south of Union to Vereeniging by the 9 p.m. train ex Johannesburg on Wednesdays.

TO EAST LONDON—Tuesdays.

TO PORT ELIZABETH—Wednesdays.

TO PORT ALFRED—Saturdays.

TO MOSSEL BAY and GEORGE—Sundays.

For full particulars regarding Fares, etc., see booklets.

W. W. HOY,
General Manager.

Johannesburg,
December, 1916.

Fraser &
Chalmers, Ltd.
Corner House,
JOHANNESBURG.



Fraser &
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P.O. Box 619.
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Telegrams: "VANNER."
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